Telephony

The Journal of the Telephone Industry

JULY 24, 1943

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"When Johnny Comes Marching Home"

Each of us looks forward with keen anticipation to the day when Johnny comes marching home triumphantly from victory over the enemies of freedom.

Then, not only will loved ones be reunited, but, also, they will have at their disposal the advantages of many engineering and manufacturing developments resulting from lessons learned during wartime production.

Not the least of these developments will be the finer things in telephony which Stromberg-Carlson will have to offer. Busy seven days a week at wartime production of communications equipment for the armed forces, Stromberg-Carlson is even now planning how better to serve the telephone field in which the company has played such an important part for nearly half a century.

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Above is the Kellogg Common Battery switchboard installed in an important Army post in Texas, as it looks today. Through the cooperation of the Southwest Telephone Company and the Kellogg Company, the expansion of the board from three positions to the present nine was handled quickly and efficiently without interrupting existing service. The present board is equipped with 1,000 lines. On busy days it handles over 22,000 calls.

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When Army Camps Suffer From

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Like healthy boys, many Army centers quickly outgrew their "clothes." A typical example is an encampment deep in the heart of Texas. At this great training post, rapid expansion of the training program brought about a need for increased facilities. One of the important requirements was for modern, enlarged central office telephone equipment.

The Southwest Telephone Company (headquarters at Brownwood, Texas) was given the responsibility of installing additional equipment to service the growing telephone traffic. And the equipment specified was built by Kellogg Switchboard & Supply Company.

As a result, this Texas camp now boasts a telephone system thoroughly adequate to its needs. Twenty-two operators keep the nine-position exchange operating on a 24-hour-a-day basis, handling local and toll traffic which at times exceeds 22,000 calls a day!

Naturally, it's a matter of pride and satisfaction that Kellogg products are playing such a critical role in the Nation's war effort. Kellogg not only supplies central office, fire reporting and P.B.X. switchboards for military use, but is also furnishing portable field switchboards and telephones; head and chest sets of various types; hand, palm and throat microphones; jacks and plugs; cords; noise filters; and many other special items of equipment and standard Kellogg telephone products.

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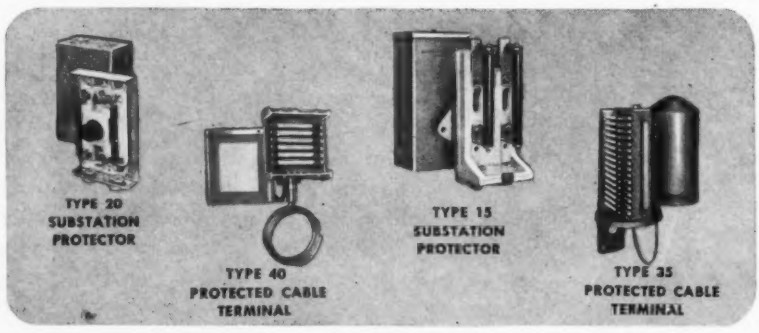
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The Journal of the Telephone Industry

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A Selected List of Telephone Books

In this war emergency knowledge is needed to help achieve victory. Technical books and information assume greater importance as a means not only of better fulfilling our niche in the war effort but of self-improvement. From this list of telephone books, with brief statements of their contents, employes may find one or more they will want to secure for study and reference.

• ***How to Build and Repair a Farm Telephone Line*, published by Telephony Publishing Corp.**

Eight-page booklet, unbound, 25 cents per copy to non-subscribers of TELEPHONY; special prices available to subscribers and to anyone ordering 25 or more booklets. This booklet, well-illustrated with photographs and diagrams, tells what was done to place a run-down farm line in good condition to furnish excellent service. The text describes how to attach wire to an insulator, how to attach brackets, how to set a pole, how to string wire, how to make a splice, how to protect telephone line from power line hum, how tree branches touching wires hamper transmission, how to connect drop wire to line wire, how to attach drop wire to house, how to connect house line to telephone, and how to connect the ground rod. The materials needed for a farm line are also listed.

• ***Rural Telephone Trouble*, published by Telephony Publishing Corp.**

Four-page reprint of an article published in TELEPHONY giving 33 magneto telephone and line troubles most commonly encountered, with suggestions as to the most likely cause of each —whether in the telephone set, the protector, the line, or the central office. Cost is 25 cents per copy to non-subscribers of TELEPHONY; special prices available to subscribers and to anyone ordering 25 or more reprints.

• ***What You Should Know About the Signal Corps*, by Harry M. Davis and F. C. Fassett, Jr. (1943)—214 pages, 16 illustrations.....$2.50**

Credit for the excellent communication service that cements America's huge Army into one powerful, smoothworking machine goes to the Signal Corps—which consists of technically-trained men who procure equipment and transmit messages, install Army telephone systems and radio sets as well as repair them when they break down, and operate the more complicated signal communication networks. In addition to the occupations resulting from the job of transmitting messages, the book covers such activities of the Signal Corps as their experiments in meterorology and aviation, and the making of training films and the taking of action pictures in battle, and gives the history of communication in the Signal Corps. This non-technical book is of like interest to civilians or servicemen.

• ***Electrical Fundamentals of Communication*, by Arthur L. Albert (1942) 554 pages.....$3.50**

This book deals with fundamentals of electricity as applied to communication, including telegraphy, telephony, and radio. Contains basic electric circuits and phenomena using illustrations, terminology and problems from communication industry standpoint. Contains tables and 359 excellent drawings; is non-mathematical and clearly written for communication people having little or no college training. Especially suited for use in telephone training courses for new employes. Also valuable for employes who wish to extend their knowledge of electricity. A summary as well as review questions and problems given at end of each chapter.

• ***Soldering for Workshop, Farm and Home*, by John Bonert (1941); 111 pages, 28 illustrations.....$1.25**

Valuable soldering information for telephone plant men, particularly apprentices, is presented in this book written by a telephone man with years of practical experience. The book discusses soft soldering, fluxes, tinning, soldering coppers, wire splices, soldering on lead, closing seams in a split cable sleeve, soldering and sweating with a torch, joints, hard soldering or brazing, construction of a soldering copper holder and pad, etc. No scientific terms or complications have been used in the book, which is intended to help the beginner or to refresh the memory of an experienced worker.

• ***Electrical Communication*, by Arthur L. Albert (1940); 534 pages (second edition).....$5.00**

Presentation of electrical theory of communication, including vacuum tubes, networks, filters, and discussion of entire industry. Various subjects considered as related to one another in modern communication systems. Designed as a college textbook and reference book for those having technical training. Others will find much of value in it, as use of mathematics has been limited but not at a sacrifice of engineering exactness.

• ***Elements of Utility Rate Determination*, by J. M. Bryant and R. R. Herrmann (1940); 464 pages.....$4.50**

Based on tested and workable methods, this book discusses factors, methods and problems of evaluating public utility property and service for rate-making. The essentials of valuation, depreciation, expense, return, etc., as factors in establishing proper rates for various utility rates are given. Citations presented from background and key cases decided by commissions and courts.

• ***Storage Batteries*, by George W. Vinal (1940); 464 pages (third edition).....$5.00**

The physical and chemical facts and theories about storage batteries are summarized and their various applications described in this book. Emphasis is laid on the scientific principles of storage batteries without permitting the text to become too technical. The physical, and chemical properties of the materials used in batteries are discussed as they relate to battery performance, and a general description of manufacturing methods given. Especial attention is directed to the operation and testing of batteries.

• ***Fundamental Electronics and Vacuum Tubes*, by Arthur L. Albert (1938) 422 pages.....$4.50**

The increasing use of vacuum tubes in telephone work makes this non-mathematical book of practical value to persons in engineering and operating branches of telephony. The book discusses the principles of electronics and the theory of vacuum tubes, photocells and copperoxide varistors in telephone circuits and radio. It delves into the theory of these devices and the design and operation of circuits in which they are used.

• ***Electrical Engineers' Handbook*, electric communication and electronics, volume 5, by Harold Pender and Knox McIlwain (1937); 878 pages.....$5.00**

This reference book for communications engineers contains engineering data and formulae concerning modern networks. Discussions are presented of telephone circuits (local, toll and program facilities), radiotelephone systems, and high frequency transmission, profusely illustrated with line drawings, as are the other sections. These sections include acoustics, telegraphy, sound-reproduction systems, facsimile transmission, television, electronic control and navigation equipment.

• ***Communication Engineering*, by W. L. Everitt (1937); 727 pages (second edition).....$5.00**

Book designed for engineers and those with technical training; gives fundamental principles of telephone, telegraph and radio communication without going back to the beginnings of the entire electrical engineering field. Transmission networks and circuits, involving coupled circuits, impedance transformations, equalizers and bridge circuits are treated. Inductive coordination is discussed with the latest theories for minimizing interference. Discussion is given of other links in the circuits which make possible radiotelephony or carrier-current systems, including vacuum tube detectors and amplifiers. Mathematical ideas, beyond calculus, are introduced just before they can be applied.

• ***Inductive Coordination of Electric Power and Communication Circuits*, by Laurence Jay Corbett (1936); 161 pages.....$3.00**

This excellent book discusses the nature of power transmission and of communication transmission, the effect of magnetic and electric induction and various influence factors. Susceptiveness and coupling factors, effects of conductor arrangements, transpositions in power and communication circuits and their coordination, power system wave shape, control of residual voltages and currents and many other phases are discussed. This book should contribute to a fuller understanding by power and communication engineers of each other's problems.

• ***Telecommunications — Economics and Regulation*, by James M. Herring and Gerald C. Gross (1936); 544 pages.....$5.00**

Dealing primarily with the economic and public service aspects of the communications industries, the major purpose of this book is to evaluate existing state and federal regulation in the light of the requirements of national policy, as determined by the present federal administration. The subjects covered include the growth and development of the telegraph industry, submarine telegraphy, the telephone industry, the development and history of radio communication and broadcasting, state and Federal regulation of the communications industries.

• ***Telephone Theory and Practice*, by Kempster B. Miller (1933); 1414 pages.....$15.00**

A set of three volumes, "Theory and Elements" (1930, 468 pages, $5); "Manual Switching and Substation Equipment" (1933, 439 pages, $5); and "Automatic Switching and Auxiliary Equipment" (1933, 494 pages, $5). Volumes may be purchased separately or as a set. This series replaces "American Telephone Practice" by the same author, published early in the century. The set comprises an excellent source of accurate information of entire subject of telephony.

• ***Transmission Networks and Wave Filters*, by T. E. Shea (1929); 470 pages.....$6.50**

A specialized book which deals with principles of transmission networks, electric wave filters, and composition of transient waves. It is intended for student engineers or graduate engineers.

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ENGLAND'S COMMUNICATIONS

Kept Open Despite Bombs

In a letter to an official of an American engineering firm, a British communications executive describes effect of German bombing raids upon telephone and telegraph facilities of Great Britain, and how service was restored.

IN AN EFFORT to provide its readers with authentic information relative to the effect of the German bombing raids over England on the telephone and telegraph systems of that country, TELEPHONY has secured permission to reprint a news letter sent to Davis M. DeBard, vice president, Stone & Webster Service Corp. of New York City by W. Chetham-Strode, Home & Shipping Sections, Commercial Relations Division, Telephone and Telegraph Systems, London.

Mr. Chetham-Strode gives an interesting engineering and human interest story of telephone and telegraph service in London during the war. He describes bombed exchanges, difficult repairs made, instructions to operators, courage of employes and many items of interest to all telephone men and women.

Mr. Chetham-Strode's letter to Mr. DeBard follows:

"I am glad to answer your request for a news letter on the telephone and telegraph utility industry of Britain during the war.

"The first enemy bomb on the mainland of Great Britain since the 1914-1918 war fell near Wick in north Scotland on the night of April 10, 1940. On May 24 in the same year the first industrial town was attacked—Middlesbrough. The first bomb on the London area hit ploughland at Addington in Surrey on June 18, 1940.

"In the 11 months from September, 1940, to the end of July, 1941, between 45,000 and 50,000 high explosive bombs fell on the London region; incendiaries were numbered by the million.

"During that September the attacks were concentrated on London. In the following months, however, they spread to the provinces; to the arms towns—Coventry, Bristol, Sheffield, Manchester; to the shipping centres—Liverpool and Merseyside, Southampton, Cardiff, Portsmouth, Swansea, Plymouth, Belfast, Clydeside and Hull; to the quiet places of the agricultural districts, and to the cathedral towns. Nearly everywhere the bombs came down, and they did not all fall harmlessly in fields and parks.

"They fell on the railways and main roads; on houses, post offices and telephone exchanges. Telegraph and telephone communications were seriously interrupted. In the London area alone between September, 1940, and September, 1941, bombs fractured 1,695 cables. The repair of this damage meant the plumbing of nearly 3,000 joints and connecting more than 500,000 wires.

"There is hardly a main road in the country without at least one cable somewhere beneath its surface. Frequently where cables converge towards the exchanges there may be as many as 100 buried below one thoroughfare. In the towns these often run alongside gas, water, electricity, sewer and other services—services which do not mix well when all are smashed by high explosives. And, on many occasions, they have been smashed and mixed together.

"Nearly 19,000,000 miles of wire made up the telephone and telegraph network of Great Britain in peacetime, and all but 1,600,000 miles underground. But the companies were not idle in the breathing space between the time of the Munich crisis and the outbreak of war, and during the first quiet months of the conflict. Heavy demands for telephone and telegraph service came in from the many branches of the fighting services and home defence. Lines had to be provided to aerodromes and munition factories, to gun and searchlight posts, to ambulance stations, emergency group centres, schools and hospitals, and alternative means of communication had to be fixed up for the big utility undertakings. Thousands of miles of cabling and vast quantities of plant had to be found.

"It is over the telephone system that instructions are issued to sound the siren warnings on the approach of enemy aircraft. From observer posts, equipped and wired by telephone engineers, the first news is received at fighter command. Here the state of warning in the various districts is indicated by colored lamps illuminating a large map—designed and constructed by engineers. On the basis of the information received from the observer posts the 'warning officer' at fighter command issues the necessary warning messages. These are passed forward to certain main distributing centers and distributed by telephone to the district centers concerned. From these centers, which are in telephone exchanges, the warnings are transmitted to the final distributing centers whence they go out to the air raid precaution parties and other authorities. There is a complete system for warning over 10,000 points.

The exchanges are staffed throughout the 24 hours.

"The communications of the home defence services are vital. Without them the firemen and wardens, policemen, rescuers, ambulance workers and roof spotters could not carry on.

"All this additional work meant heavy pressure on a staff that had lost tens of thousands of its skilled men to the forces. But it was done and the system worked smoothly.

"Then came the Battle of Britain in the late summer of 1940 and the night bombing. London was the main target of the enemy attack. The chief switching and operating centers escaped widespread damage—at least during the first few months — but the underground cable plant was smashed at many points.

"Repairs were put in hand at once. Among the first to arrive on the scene of any 'incident' were the linemen. The full force of the organization was concentrated on the important work of reinstating damaged cables.

"Air raids themselves were not allowed to interfere with the work of reconstruction. But immediate access to the damaged plant was not always possible owing to its being buried under tons of debris, and to burst water pipes and other obstacles. Even when the fractured cables were reached it was not a simple matter of joining up a single broken link; each pair of wires in the cable, which may contain from 200 to 1,000 pairs, had to be joined through again. Very often in one bomb crater there were several such cables to be repaired. And there were many bomb craters.

"In London in that autumn of 1940 the repair work was expedited by the temporary release from the army of trained engineering staff. Despite all the difficulties at this time 20 million local calls a week were being connected in London, and in addition about 300 thousand long distance and toll calls a week were originated by London subscribers.

"One telephone building, an important link in the communication system for the city of London, was destroyed by fire. The exchanges housed in that building provided service to a total of 18,000 subscribers' lines, just prior to the outbreak of the war. These subscribers originated nearly 320,000 calls a day, most of which were dealt with by automatic plant.

"In addition to the large number of exchange lines terminating in the building, 9,000 private wires rented by subscribers in the city passed through it.

"The fire raged through the second to the sixth floors and the plant housed on those floors was damaged so extensively that with a small exception it was of no further use.

"Although access to the building was rendered difficult and dangerous by the rubble in the streets and walls tottering at all points of approach, men and women employes were on the premises early on the day following the fire, surveying the damage and removing such records that had survived through being kept in steel cabinets.

"The first job was clearing the approaches and within three days new apparatus began to arrive. It was realized, however, that the time taken to reconstruct the damaged parts of the building would be too long to enable an early restoration of the service to be given to the affected subscribers so arrangements were made to give service on other exchanges. Subscribers' cables entering the damaged building were terminated on one side of a special frame on the other side of which were the cables running to automatic exchanges in the neighborhood. Cables were also connected to a new exchange which had been held in readiness for such an emergency.

"By means of simple connecting wires between the two sides of the frames it was possible to distribute the subscribers among the other exchanges. Altogether over 60,000 pairs of wires were terminated on the new frames, and over 20,000 connections made from one side of the frames to the other. In making the connections about 300 miles of twin wire were used.

"Work proceeded at a rapid rate. Meanwhile, there was the problem of giving service to those subscribers who, having lost their premises, had been unable to make private arrangements with business associates to accept their incoming calls. This was solved by opening special telephone bureaus at various points of the city. Each contained 50 or more telephone circuits, some housed in cabinets but many in open booths. Incoming calls were written down and delivered to the desired subscriber if he did not, by previous arrangements, happen to be on the premises at the time.

"In one great fire raid serious damage was done to the central telegraph office. The building was hit by many incendiary bombs, all of which were extinguished by staff engaged on fire watching and patrol duties. But the office was surrounded by blazing buildings, and flames and burning debris falling on the central telegraph office defeated all efforts of the staff to save the premises. When it was seen that the place was doomed every man available was mustered and they raced into the building and saved many of the valuable instruments.

"The central telegraph office is—or, one must now say, was—the center of the British telegraph system. Its possible loss was visualised before the war, and alternative means were provided elsewhere to continue the service should it meet with complete or partial disaster. Circuits had been led in at suitable points where reserve instruments were stored. On the day following the fire the staff were transferred to their new stations where it was possible to carry on a restricted service to all parts of the United Kingdom and Northern Ireland and to countries overseas. These were supplemented by special motor services to certain offices in the London district, and subsequently additional reserve offices were brought into operation.

"The companies' rule books issued to their engineers contain no sections dealing with what to do when a ton high explosive bomb hits a cable chamber and blows bricks and cables to fragments. So the men had to work out the answers to the questions as they went along. One bomb penetrated a road surface and destroyed an underground tunnel through which two telephone cables ran. The tunnel was blocked to the roof with London clay. The circuits were temporarily diverted and the engineers faced up to another new problem—how to bridge the gap and join the ends of the cables again under the ground.

"It would have taken too long to drive shafts from the road above to link up the broken ends, so they decided to bore through the clay.

"They used a method known as 'thrust boring,' where a hand-operated hydraulic ram forces a strong steel rod through the ground until it has penetrated to the far end, when a steel tube is fastened to it and then pulled back again by the ram. It is a job that demands skill and experience even in favorable conditions. Here the conditions were far from favorable, as a sharp corner in the tunnel had to be negotiated.

"The crater was full of debris from the road above and there was no way of anchoring the ram. But the effort had rather surprising success and the rod was driven through the clay to the far end of the obstruction. The worst part of the work seemed to be over. In fact, however, it had only just begun.

"There was a slight downhill slope at the far end of that tunnel, and sewage seeped through the crater and started to fill the hole—evil, stinking sewage. It was going to be a race

against time to finish the repair work at the end of the tunnel before the water reached the roof.

"The steel tube that was being pulled back became obstructed about half way and parted company with the boring rod. There was nothing else for it but to burrow through the clay to reach the pipe.

"That work in the small tunnel was dangerous. The clay was likely to fall in and bury the men, the sewage was creeping ever higher, ventilation steadily worsened, and the tunnel looked like collapsing at any moment. The men carried on; they failed to reach the tube because of the obstruction it had fouled.

"Another method was tried. Sweep rods were jointed and pushed through the steel tube and on through the wet clay to the other side. Where rods could go so could a small cable. Thus, by sheer hard physical effort, a 100-pair cable was dragged through. By now the water was waist deep, but the cable was successfully jointed.

"That was cable Number One. There still remained cable Number Two, with 254 pairs in it. The clay at the top of the tunnel appeared to offer less obstruction than on the floor, but a thrust borer could not be used other than at floor level. Therefore, the engineers drove steel piping through with sledge hammers, and a second cable was drawn through the hole.

"All this time the air was becoming more foul and the sewage never ceased rising. There were incessant air raids, but the job had to be done because many of those circuits were vital.

"The jointing was completed. There were seven feet of water and sewage in that tunnel when the last man was dragged out of it. The official report concludes with these words: 'These men sought no reward but the satisfaction of knowing that they had done well all that was asked of them. It was their privilege to restore to service vital communication circuits.'

"Some reports tell of lone men tackling jobs without help. There was one man of whom his supervising officer wrote: 'His chief object in life appears to be to defeat the enemy.' During one raid he was sent out to repair a severed main cable holding many circuits. He had to wade through icy water and grope about in the crater to find the broken ends. As he worked he heard another bomb falling immediately overhead, but the mud and his rubber boots barred any rush to safety. He threw himself flat in the filth as the bomb exploded across the street—then he carried on until the circuits were restored.

"MADAM, DO YOU REALIZE THE WAR MAY BE OVER BEFORE THESE BOYS GET A CHANCE TO CALL HOME?"

(From 195 Bulletin)

"There was another case in which repairs had been pressed on hurriedly for several days when one of the men did a bit of digging to find out what the hard object was on which he kept treading. It was just covered with dirt at the bottom of the crater. He uncovered it. It was a heavy unexploded bomb.

"If work on the lines outside was hectic it was not exactly all quiet fun at the switchboards indoors. In Great Britian telephone exchanges are usually on the top floors of buildings where good light is obtainable. And many of them have glass roofs. However severe a raid may be, a nucleus staff remains in that switchroom to complete essential calls. And, in most cases, the staff do not comprise tough old ex-service men but girls and young women.

"At one exchange a heavy bomb fell through the roof. It did not wreck the switchroom but tore a great hole in the blacked-out glass which meant that all lights had to be switched off to preserve the black-out. The 'calling lamps' on the board were too bright to be used unshielded. Enemy aircraft were overhead in hundreds and keen eyes were looking down seeking lights on which to drop their bombs.

"A number of girls volunteered to stay on. Tarpaulins were draped over them and their instruments, and, under these, hot and stifled, they put through the calls. Their 'Number, please?' mingled with the crashing of glass and the droning of the bombers. The raid lasted all night but the girls stuck it out.

"Official reports are supposed to make dull reading but here is one given exactly as it was received at headquarters in London and it is not dull: 'At 10 P.M. during a heavy raid volunteers were sought to go up to the roof switchroom. Two girls responded and ascended amid broken glass and rubble, their way being lighted only from the red glare of burning barges

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BY FRANCIS X. WELCH

Washington Correspondent for TELEPHONY

State Department's policy of quiet patience in regard to merger of international communications praised. . . . War Labor Disputes Act has its advantages as well as disadvantage. . . . NWLB requiring utilities to state, when seeking rate increases, if wage and salary increases are officially ordered or approved.

PRESIDENT ROOSEVELT'S recent reference to our successful foreign policy in obtaining the political capitulation of the French islands, Martinique and Guadalupe, offers a striking commentary on the patient and able work of our State Department. President Roosevelt said that we had succeeded in "waiting out" the Vichy government official, Admiral Robert, and, as a result, obtained a "base on balls."

In consequence, without spilling a drop of blood or arousing any understandable resentment among Frenchmen (which certainly would have followed our intervention by violence), we have obtained what we wanted in the first place. The State Department's policy of quiet patience has been equally effective in the continuation of Spanish neutrality, the friendly neutrality of Turkey, and the active collaboration of the French in North Africa. This is because our State Department, like the British Foreign Office, is not an amateur outfit. It knows what it is doing much better than critical hotheads and firebrands who have been constantly advising more precipitate action.

Now comes news that the State Department is bringing its sure-footed diplomatic experience to bear on a problem of international communications which should greatly interest even our domestic telephone industry. The idea is not new. A merger of privately owned facilities in the United States for international communication has long been the goal not only of the various communications interests which would be affected, but also responsible government officials.

But there has been a certain amount of suspicion with respect to any planning along these lines by the Federal Communications Commission. The suspicion has been that anything the FCC cooked up would be pretty much under the thumb of the FCC. And it was largely for this reason that the Navy successfully opposed FCC Chairman Fly's attempt to incorporate in the domestic telegraph merger bill as it passed through Congress, a provision which would have authorized an international merger of American communications interests.

But the State Department's plan is a long-range post-war proposition which is being projected without any publicity by a group headed by Breckenridge Long, Assistant Secretary of State. One of the problems which has not yet been definitely solved is whether the eventual union should include only radio and cable companies or cable, radio and telephone as well.

If the over-all cable, radio and telephone merger is decided upon, it would result in a consolidation of the international communication phases of the following companies: Mackay Radio & Telegraph (subsidiary of I.T.&T.), Tropical Radio, RCA Communications, American Telephone & Telegraph Co. (international telephone circuits), Western Union, Press Wireless, Commercial Cable, All-America Cables & Radio and Commercial Pacific. The last named is owned principally by British and Danish interests, which the State Department hopes to convert to the idea of letting their holdings go into the common pot.

One reason why there is still some reticence about including the international telephone business in the proposed consolidation is the fact that such a union would run counter to the policy lines of demarcation which have been set up for our domestic communications system.

Here in the United States, Congress apparently favors a consolidation of all "written word" carriers of intelligence, principally telephone and telegraph, but even including teletype now operated largely by the telephone industry. Further, however, this policy draws the

line between the "written word" carriers and the "audible word" carriers, principally the telephone companies.

Assuming that this segregation between telephone and telegraph on the mainland will continue, and in view of the fact that domestic telephone companies will have the responsibility for domestic terminal distribution of international telephone communication, there may be good business and technical reasons for retaining a similar segregation of communications facilities in the international field.

At any rate, the Breckinridge Long committee is known to regard the primary problem of international communications merger to be that of resolving the controversial arguments on the relative value of submarine cable and point-to-point radio. Since there is likely to be a financial battle in any attempt to sink cable and radio interests into the same corporate entity, there is something to be said for the policy of solving that question first before complicating it with the additional question of whether international telephone service should continue on a somewhat competitive basis with cable-radio service.

Of this much we may be certain: The State Department is not going to allow any left-wing ideology to slip into any such plans, which is more than could be said for planning in other agencies of our government, notably the recently defunct Board of Economic Warfare. The State Department's primary concern is to look out for the international interests of America as a whole without regard for various group concepts of political ideology. Already the Justice Department (through its anti-trust division) and the Navy Department have been won over to the idea that an eventual union of international American communications interests is desirable.

Perhaps it is not polite to stress the point at this time, but the State Department is not overlooking the fact that in the post-war world the scramble for international communications control and the tremendous power that goes with such control, the foreign competition will be chiefly government-supported monopolies. The biggest of these is Wires & Cables, Ltd., controlled by our great fighting ally, Great Britain.

If the strength of American private business interests in the international communications field is dissipated by division into a half-dozen smaller concerns as at present, they will be in no position to meet the commercial challenge of the foreign monopoly. Our State Department wants to put an end to that and to see that such American business interests are enabled to meet foreign competition on even terms.

(Courtesy, NEW JERSEY BELL)

"Sir, we think we have discovered a new system of stringing wire in the jungle."

* * *

The Smith-Connally law, which was passed over the President's veto, has been on the books long enough now to warrant a less emotional appraisal than was possible during the controversy which surrounded its enactment. The bill has been called by industrial and labor interests alike, a "hodgepodge," an "impractical symbol," a "spite bill," and other names which, at best, damned it with faint praise.

But actually there is no reason why this law should not work out fairly well if the administration charged with responsibility for enforcing it really wants to make it work. There have been many other bills which became law not one-half as practical—the recently expired Guffey Coal Act being a pretty fair sample.

The Smith-Connally act is known officially as the War Labor Disputes Act. Despite propaganda that it is a "strike busting" law designed to perpetuate "yellow dog contracts," analysis reveals that it is not a strike-breaking law at all. The real purpose of the new law is to provide "cooling off" machinery in labor disputes along the lines which have worked out so successfully for the Railway Mediation Act.

To give a concrete and chronological example of how the law is supposed to work, let us assume that a dispute has arisen between employes and management in an essential plant. Let's say that the dispute has reached the point where a strike is either threatened or actually planned. The War Labor Disputes Act comes into play at this point with the provision that "representatives of employes" must give the government 30 days' notice of an intended work stoppage. The law also provides that a secret ballot may be taken under surveillance of the National Labor Relations Board to permit the workers to express themselves.

During this first stage of the law's operation the statute states that employer and employes must continue to work under existing conditions until a vote has been taken. However, no penalties are provided for violating this provision beyond a rather vague threat of damage suits which might be filed by "injured" parties. Judging from similar teeth in other laws there isn't much for either labor or management to fear in this clause.

The second step in the law's operation comes when a vote has been taken and it is found that employes are in favor of a strike. At this point the law authorizes the government to seize the plant in question and operate it "until production efficiency" has been restored, after which the property must go back to its owners. During the time the property is under the control of the government the law makes it unlawful for anybody, under penalty of fine and imprisonment, or both, to conspire, finance, instigate, or encourage a strike or an interruption of normal operation of the plant (such as a slowdown, sit-down, quickie, etc.). Notice that the law *does not make it unlawful for the individual worker to remain away from work* if he pleases, provided it is not a part of a concerted plan, instigation, or conspiracy, etc.

That is really all there is to the War Labor Disputes Act as far as interfering with strikes is concerned. It con-

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THE PLANT MAN'S NOTEBOOK

BY RAY BLAIN • TECHNICAL EDITOR

EXCESSIVE heat is often emitted from a strip of 20 busy lamps on a manual switchboard when the traffic is heavy. This heat may even damage the wiring or insulation of the jack strips if it is neglected for a long period of time. Perhaps the most satisfactory corrective measure is to replace the 24-volt lamps with a 48-volt type. The higher voltage lamp will provide ample illumination for a busy signal.

* * *

In the old days before the galvanizing process was perfected, baked enamel bridle rings were extensively used. These rings weathered well, but the enameled surface was often damaged during installation. It is not believed that the enameled surface provided any insulation qualities over the galvanized variety.

Strange as it may seem, there are telephone men today who feel that they must use enameled bridle rings. If any of our readers have information as to why the galvanized bridle ring cannot satisfactorily replace the enameled variety for all telephone work, we would like to receive all pertinent data on this subject.

* * *

Perhaps someday there will be developed a drop wire whereby two small insulated conductors can be supported by a small steel wire. It is believed that one braid could be used to cover all three wires and the steel would provide the supporting strength. The small conductors would provide necessary conductivity.

* * *

It would seem that someone could combine to advantage a main frame and power panel for use in the small exchange. The protectors could be on one side, the terminal strips on the other, and the power panel, rectifiers and ringing machines at the top. This would make a compact unit which could be installed at one end of a small switchboard. The storage batteries could be housed in the unit or separately, as desired.

* * *

We wonder what improvements will be developed for our use in post-war communication systems when we learn of the plans now being perfected by the "imagineers" of various telephone manufacturers. We shall not venture a "guesstimation" as to the overall result, but we feel confident that marvelous communication facilities will be available for the enjoyment of a world at peace.

* * *

Lt. Col. A. B. Cooper, Newfoundland, paid the Signal Corps Plant Engineering Agency in Philadelphia a visit on June 28 and gave us some interesting information on communication in that part of the country.

Colonel Cooper also brought us the sad news that our old friend, Capt. E. E. Snell, started on an airplane trip last February and never arrived at his destination and is listed as missing. Captain Snell was one of the old-time Signal Corps men known and liked by many telephone men.

* * *

We understand that development work now being conducted on cable splicing wiping cloths indicates that a new type may soon be placed on the market which gives promise of being far superior to the old-style variety. No doubt cable splicing after the war will be a simple operation as compared with present methods.

* * *

Whenever we receive a letter from our long-time TELEPHONY reader, E. D. Selmser of Freeport, Tex., he always closes with, "Telephony yours."

* * *

Some of our larger telephone companies have completed plans as to the action they will take should one of their exchanges be bombed. We hope that such action will never be required, but if we should be bombed, restoration of communication will be most important; therefore, we should all give this subject some serious thought.

* * *

In the discussion of telephone transmission the other day with several engineers the question of crosstalk came up for serious consideration. It was generally agreed that crosstalk is really not serious until it becomes understandable. That is, you may hear babble in the background on a circuit, but it is not really bothersome until the volume increases to a point where it is understandable. It is also true, however, that for good transmission all evidence of crosstalk and other background noise should be held to an absolute minimum on circuits at all times.

* * *

During wartime such as the present, many persons are glad to have a telephone even though it may be and often is a four-party line. Just the same, there are complaints about the other party answering the wrong ring and listening in on the other party's

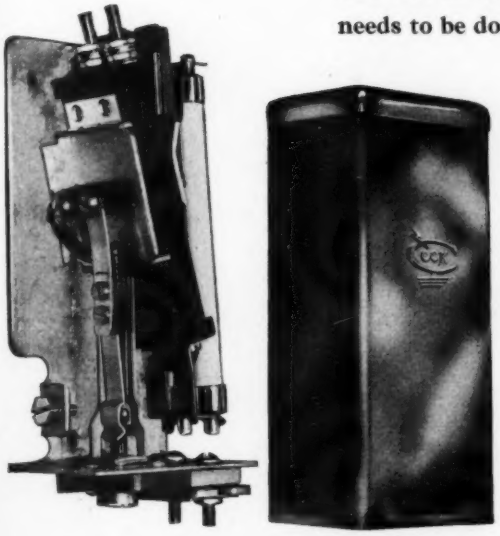
(Please turn to page 28)

First Choice . . . *FIELD and FRONT OFFICE*

Wherever telephone lines are strung, you will find Cook Electric telephone equipment first choice of both the men in the field and in the front office.

Cook Electric protection and distribution devices have the precise detail, the rugged durability, compactness and weather tight construction that only a half century of close understanding of an industry's needs can give.

Our engineers work in the field with linemen, maintenance men, plant men and executives. We hear their comments and receive their suggestions. We see for ourselves what needs to be done. Then we use every facility of our designers, our testing laboratories, our precision workers and machines to build the best unit for the job . . . and to keep making them better.



The Sentinel Pole Jack. *Especially designed for installation at munitions plants, airports, national park services, highway patrols. Compact and weatherproof.*

Cook Electric products are now proving their superiority under the rigorous demands of wartime service both in the armed forces and in civilian communications. When the war is over the many new developments of our engineers will be available to provide even greater efficiency to this amazing industry.

All telephone equipment manufacturers and supply houses distribute Cook Electric products.

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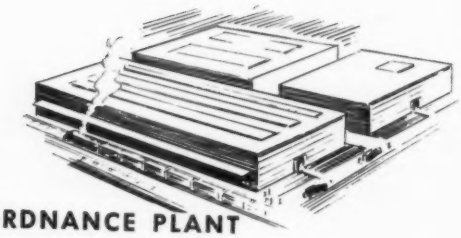
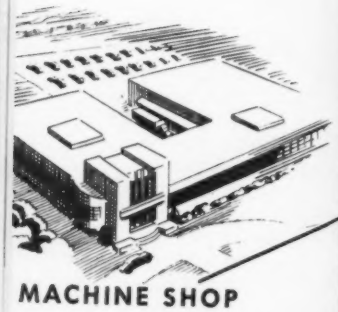


ORDNANCE PLANT

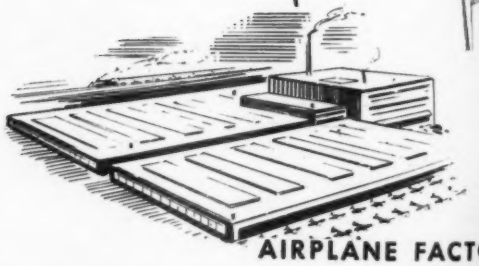
Built
But

ELEPHONE EXCHANGE



MACHINE SHOP

RESIDENCE



AIRPLANE FACTORY

The Army-[illegible] Pennant with two [illegible] continuous achievement [illegible]tion, flie over the [illegible] Automatic Electric.

r Peace—
lelping Win a War!

Designed for peace, Strowger Automatic telephone equipment is serving the purposes of war on every front. With nearly all of our production now being used directly or indirectly in the war effort, equipment produced during more peaceful times is helping win the battle here at home! Here are some of the ways it serves:

WITHIN WAR INDUSTRIES:

Automatic Electric's private dial telephone equipment is helping hundreds of war plants produce more battle materials, faster. . . . Executives and workers are kept in instant touch with one another—time is saved in every department—important production speeded up—all through fast automatic intercommunication!

BETWEEN WAR INDUSTRIES:

Through Strowger Automatic public exchanges in every part of the country, messages shuttle day and night—speeding the flow of raw materials—coordinating the work of contractors and sub-contractors—promoting greater speed and efficiency in meeting the interlocking requirements of supplier, producer and the ultimate consumer, America's fighting forces.

IN TELEPHONE EXCHANGES:

Here Strowger Automatic equipment helps by handling peak loads with amazing flexibility; requiring a minimum of maintenance attention; lending itself to rearrangement to meet changing traffic needs; and freeing hands and arms of trained workers for the countless war tasks that machines cannot do.

IN HOMES:

Because of its long life and dependability, Strowger Automatic equipment is keeping telephone service at normal levels in thousands of American homes—maintaining morale for factory and farm workers who know their vital calls will always get through.

ARMY E

The Army-[illegible] Pennant, with two [illegible] continued achievement [illegible]tion, flies over the [illegible]tomatic Electric.

AUTOMATIC ELECTRIC

ORIGINATORS AND DEVELOPERS OF STROWGER STEP-BY-STEP MACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

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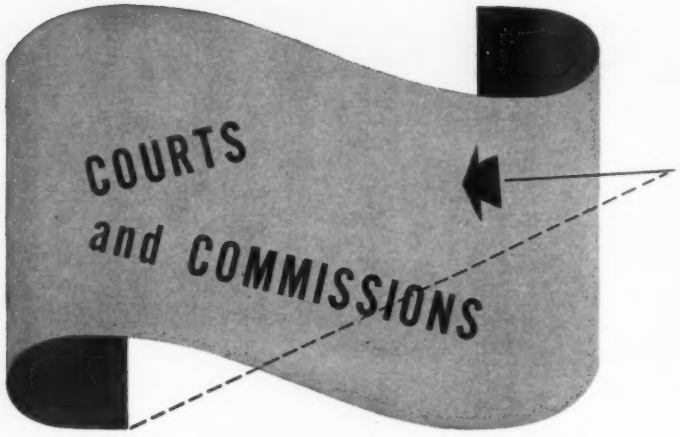

Testify in Telegraph Merger Case Before FCC

Unless the Federal Communications Commission gives some relief in writing its order in connection with the proposed merger of the Postal Telegraph Co. with the Western Union Telegraph Co., more than a score of Oklahoma towns, which now have telegraph service, will be without such facilities states B. Richardson, telephone engineer of the Oklahoma Corporation Commission.

Mr. Richardson, and Floyd Green, attorney of the commission, returned from Washington, D. C., July 12, where they appeared before the FCC and presented a suggested amendment to the proposed telegraph merger order which would provide for arrangements with telephone companies, or other commission agencies, to handle telegraph business in towns where the Western Union is not now represented.

At present several Oklahoma telephone companies act as agents of the Postal company in smaller towns which have no railroads, or no uptown office of the Western Union. These telephone companies act as agents for the Postal on a commission basis, to receive telegrams through transmission from the nearest telegraph office, and deliver them to addressees over their telephone wires. Some Oklahoma telephone companies have teletype machines in their offices which receive the messages.

Messrs. Richardson and Green do not urge placing of teletype machines at this time when war restrictions make new installations of this kind difficult if not impossible.

"We do believe, however, that arrangements should be made with telephone companies to act as commission agencies for the merged telegraph utility," said Mr. Richardson. "Some towns are not large enough to maintain a telegraph office, or possibly a telephone company agency, but in these towns arrangements could be made with some lawyer, insurance agent, realtor, or abstractor to receive and deliver messages. After the war, teletype machines might be installed in such places where the message would be recorded automatically night or day and could be delivered during office hours."

Mr. Richardson believes that a telegraph company, which is given a virtual monopoly on the business, assumes an obligation to give as nearly universal service as is possible. He cited that Oklahoma has five county-seat towns without railroads and these towns, among many others, need and require telegraph service.

V V

Commission Permits Extension Subject to WPB Approval

The Oklahoma Corporation Commission, July 14, granted the application of Van Brandon asking that the Southwestern Bell Telephone Co. be required to extend telephone service from its Oklahoma City exchange to him at his residence just south of the Oklahoma-Cleveland county line, subject to approval of the War Production Board.

Mr. Brandon owns a five-acre tract upon which he raises vegetables and chickens. He also drives a truck delivering farm produce to market. His tract is about 900 feet within the territory served by the Southwestern States Telephone Co. from its Moore (Okla.) exchange. Because of difficulties in securing materials for extension the latter company refused to install telephone service for Mr. Brandon.

The Southwestern Bell Telephone Co. refused to install the telephone without an order from the Oklahoma Corporation Commission, because the residence is located outside the territory served by the Bell, and without authorization from the War Production Board to secure the materials to make the extensions.

Local WPB authorities refused to approve the extension, citing Order U-2, of March 25, 1943, as a bar. The Bell company expressed willingness to make the extension providing Mr. Brandon could win approval of the WPB on an appeal. The commission issued the order requiring the telephone service installed, providing the Brandon appeal to the WPB is successful.

WPB Order U-2 provides in part that, "No further additions to existing exchange central office or outside plant be permitted excepting for the following: (a) Necessary maintenance of service; (b) essential requirements; (c) public pay stations; (d) 200 lbs., of steel wire for metallic line and 100 lbs. for grounded lines for rural food-producing subscribers; (e) additional cable terminals on cable plants to expose vacant facilities otherwise not usable."

Extension of about four spans of line will be required to give Mr. Brandon connection with Southwestern Bell service. During the hearing on July 14, Mr. Brandon testified that his telephone requirements are heavy and he has to travel one mile to reach the nearest telephone, connected to a rural line. He claims that he is entitled to the service because he is engaged in the production and marketing of food, an essential war industry.

V V

Increased Rates Approved At Stacy, Minn.

Inasmuch as the "evidence produced in the record shows that the rates presently in effect are inadequate and unreasonable," the Stacy (Minn.) Telephone Co. was granted authority on July 13 by the Minnesota Railroad & Warehouse Commission to place into

effect the proposed rates and charges applied for, effective upon the first billing date after July 31.

The Office of Price Administration was notified of the proceeding but it advised the commission under date of June 12 that upon consideration it did not propose to participate.

The Stacy company operates an exchange in the village of Stacy serving approximately 113 rural stations. Figures presented for the years 1940 to 1942 showed the company is operating at a deficit, and under the proposed rates a very slight margin of profit would be attained providing operating expenses do not mount any more.

The commission approved that net rates be increased as follows: Two-party line business, from 75 cents to $1.50; four-party line residence, from 75 cents to $1.00; and rural multi-party, company-owned, from 75 cents to $1.00.

V V

Illinois Company Receives Increases in Rates

The Illinois Commerce Commission has approved the monthly net rate schedules filed by the Farmers Telephone Co. of Lee County, with headquarters at Ashton, Ill., as follows:

Business individual line, from $2.00 to $2.50; business two-party line, (new) $2.25; residence individual line, from $1.50 to $1.75, and residence party line, from $1.25 to $1.50.

Under the present schedule, an allowance of $1.60 per annum is made to each of the subscribers who reside within the corporate limits and who own and maintain their equipment. Under the proposed schedule, no allowance will be made but the company is required by the order to purchase from subscribers not less than 75 telephones per year so that eventually the Farmers Telephone Co. will own and maintain all of the subscribers' instruments within the corporate limits.

V V

USITA Appoints Committee To Meet with FCC

President John R. Porter of the United States Independent Telephone Association has appointed a special committee to make plans for a conference on August 19 with the Federal Communications Commission to discuss the commission's rules on continuing property records and their future application to Independent companies (TELEPHONY, July 10, p. 23).

The Federal Communications Commission has granted the request of the United States Independent Telephone Association that the conference be postponed from July 22 to August 19.

V. E. CHANEY

The committee consists of V. E. Chaney, Fort Wayne, Ind., chairman, Harold V. Bozell, New York City, and Vice President Clyde S. Bailey. Forty-five Class A and B Independent companies are subject to the full jurisdiction of the FCC and thus required to observe the continuing property record requirements of its Uniform System of Accounts. However, they received a six-month period in which to submit plans for keeping those records by the FCC on June 30.

The FCC has invited participation in the conference by the National Association of Railroad and Utilities Commissioners.

V V

Commission Would Postpone Rate Inquires During Wartime

With a statement that it is imperative for utilities to maintain strong financial positions during the war so they can enter the post-war period ready to take up deferred maintenance and rehabilitation of their properties, the Pennsylvania Public Service Commission recently issued a declaration that it is inadvisable for regulatory commissions to institute rate investigations of utilities during the war because of the artificial economic situation now prevailing.

V V

Missouri Hearings Open in Southwestern Bell Inquiry

Attorneys for the Missouri Public Service Commission and the Southwestern Bell Telephone Co. agreed July 12 on $116,365,794 as the original cost of the company's property used in Missouri. The stipulation was filed at the opening on that date, in Jefferson City, of hearings which will culminate the commission's six-year-old investigation of the company's valuation. The valuation, when finally fixed by the commission, may be used as a basis for possible rate changes.

The proceedings constitute the first state-wide valuation of the telephone system's property in that state. They began in 1937, after complaints by St. Louis and Kansas City that the company's earnings were excessive. Several other cities since have joined the investigation.

V V

Company Is Permitted Rate Increase in 17 Illinois Towns

Telephone rates in Jacksonville and 16 other Illinois municipalities will be increased for the duration of the war and six months afterward, according to an Illinois Commerce Commission ruling July 15. The new rates, to become effective on the first billing after July 20, will not be as high as was requested by the Illinois Telephone Co. which operates in 17 towns. The main reason advanced for higher rates is that labor costs have increased.

Besides Jacksonville, the towns affected are Carrollton, Hillview, Manchester, Patterson, Alexander, Literberry, Woodson, Bluffs, Meredosia, Murrayville, New Berlin, Pleasant Plains, Greenfield, Roodhouse, White Hall and Winchester.

V V

Eastern Indiana Company Buys Two Exchanges

Announcement has been made of the purchase of the Green's Fork Co-operative Telephone Co., which operates exchanges at Green's Fork and Williamsburg, Ind., by the Eastern Indiana Telephone Co. of Winchester, Ind. The price paid was $22,000. With the addition of these two exchanges, the Eastern Indiana company now will have 17 exchanges.

The sale has been approved by the Indiana Public Service Commission, the purchase including assets, but not the common stock.

V V

NARUC To Meet in Chicago

The National Association of Railroad & Utility Commisioners will hold its annual convention at the Edgewater Beach Hotel, Chicago, on September 14, 15 and 16.

V V

Joins the Navy's Seabees

LEONARD J. SCHNELL, son of John H. Schnell, chief accountant for the Nebraska State Railway Commission, and connected with the maintenance department of the Kearney exchange of the

Nebraska Continental Telephone Co., has joined the Seabees and has been assigned to communications work.

V V

Appointed Fire Marshal

VAN L. TAYLOR, for eight years engineer for the Nebraska State Railway Commission and having to do with valuations of pole lines, has been appointed state fire marshal. Mr. Taylor more recently has been deputy state auditor.

V V

Summary of Commission Rulings and Hearings

Federal Communications Commission

July 13: American Telephone & Telegraph Co. granted special permission to put in force on not less than one day's notice after they are filed with the commission revisions in the first revised page 5, third revised page 36 and first revised page 36A of Tariff FCC No. 208 to include a reference to Tariff FCC No. 5 of Public Utilities California Corp. for rates and regulations in connection with private line teletypewriter service at Burney, Calif.

August 4: Oral argument on petitions filed by the National Association of Railroad & Utilities Commissioners and by the Maryland Public Service Commission for leave to intervene in the proceeding on the hotel surcharges on telephone calls.

California Railroad Commission

July 9: Order issued authorizing the California Water & Telephone Co. to connect to its Hemet switchboard certain lines now connected to the San Jacinto switchboard in the San Jacinto-Hemet exchange area.

Illinois Commerce Commission

July 20: Hearings in Springfield on petition of the Holland Township Telephone Co., Mrs. Fannie Gallagher, president, for permission to discontinue operation as a public utility rendering telephone service in the village of Mode, Shelby County.

December 29: Continued hearing (postponed from June 15) on application of the Illinois Bell Telephone Co. for permission to increase rates at Carrollton.

Kansas Corporation Commission

June 24: Acme Mutual Telephone Association filed a revised schedule of rates for telephone service at Acme, and case ready for commission action.

July 9: Application filed by the Southwest Telephone Co., regarding filing general rules and regulations, now being studied by the commission.

July 12: Hearings on applications of the Central Kansas Telephone Co., Inc., for authority to adjust rates at its Pomona and Melvern exchanges, and cases taken under advisement.

July 12: Hearing on application of the Elk Falls Telephone Exchange for authority to make changes in rates for service at Elk Falls, and case taken under advisement.

July 19: Hearing on application of Ralph C. Atkinson and John T. Atkinson for permission to transfer the franchise of the Weir City Telephone Co. and to cease operating as a public utility telephone system at Weir.

July 19: Hearing on application of Virgil Whittington for a certificate of convenience and authority to transact the business of a public utility at Weir, Cherokee County.

August 3: Hearing on application of the Harlan Telephone & Supply Co. for authority to make certain changes in rates for service at Harlan.

August 3: Hearing on application of the Marion Mutual Telephone Co. for authority to make certain changes in rates for service at Marion.

August 3: Hearing on application of the Wilsey Mutual Telephone Co. for authority to make certain changes in rates for local service at Wilsey.

August 9: Hearing on application of the Mijo Telephone Co. for authority to make certain changes in rates for service at Spring Hill and Stilwell.

September 8: Hearing on application of the Western Light & Telephone Co. for authority to make telephone rate changes in Conway Springs and vicinity.

November 2: Hearing on complaint of the Missouri-Kansas-Texas Railroad Co. against the LaHarpe Telephone Co. and J. A. McDonald.

Missouri Telephone Association

July 14: Joint application filed by the Western Light & Telephone Co. for authority to sell and Clarence Hale to purchase the telephone company at Fordland, Webster County.

Oklahoma Corporation Commission

September 7: Hearing on application of E. K. Cross Telephone Co. for permission to increase rates at Oktaha. Mr. Cross states in his petition that his exchange at Oktaha has 26 subscribers and has a valuation of approximately $5,000. He claims annual losses of $309.46 during 1941 and $302.97 during 1942. New monthly rates asked, compared to present rates, are:

Business one-party, from $2.50 to $3.50; business rural multi-party, from $2.00 to $3.50; residence one-party, from $1.50 to $2.50; residence rural multi-party, from $2.00 to $3.00. Business, rural service line, minimum rate of three subscribers, at $1.25 each (from 50 cents each), or a total of $3.75. Residence, rural service line, mimimum rate three subscribers at 75 cents each (from 50 cents each), or a total of $2.25.

September 8: Hearing on application of Doyle Pope for an order to require the Southwestern States Telephone Co. to restore his telephone service from the Noble exchange of the company. The hearing was postponed from July 14 when company officials and Mr. Pope conferred with B. Richardson, telephone engineer, and Floyd Green, attorney for the commission, relative to a proposed compromise.

The line, about 4½ miles long to Mr. Pope's home was disconnected by removal of some of the poles and wires to make room for a naval camp.

"TELEPHONY" COPIES PRESENTED TO CAMP CROWDER, MO.

Another gift of back copies of TELEPHONY has been made to the U. S. Army Signal Corps. This time the presentation was made by the Missouri Telephone Association, of which Robert W. Hedrick is secretary, to the Headquarters Central Signal Corps School at Camp Crowder, Mo.

When Mr. Hedrick of Jefferson City wrote to the Signal School at Camp Crowder offering the TELEPHONY copies, he received a prompt reply from First Lt. J. W. Kruissink, assistant secretary of the school, who stated: "It is a real pleasure to receive an offer of this nature and even greater pleasure to accept. These magazines will be used by our instructors and students as a text reference."

* * *

The first presentation of TELEPHONY copies to the Signal Corps was made in October, 1942, to the Signal Corps Reference Library in Washington, D. C., after the library was established by the Chief Signal Officer. Bound volumes of TELEPHONY, dating from 1901 to the first half of 1942, were given to the library by TELEPHONY (October 10, 1942 issue, p. 55).

In November of 1942, TELEPHONY again came into possession of bound volumes of back issues and this file was presented to the library at Oregon State College, Corvallis, Ore., which is noted for its fine engineering and communication department. (TELEPHONY, November 28, 1942, p. 102.)

Since TELEPHONY began publication more than 42 years ago, much valuable technical information has been published that is available in no other form. Hence, back volumes are especially desirable for reference and research purposes in libraries of various universities and colleges as well as of Signal Corps schools throughout the country.

IN 1943
BUY BONDS
FOR VICTORY

"Hello, you Limey!"

"Very glad to see you," answered the Britisher. . . . The date: April 7, 1943. The place: A stretch of wasteland in Southern Tunisia, 42 miles from Gabes. The occasion: The historic meeting between reconnaissance patrols of the British Eighth Army, in three armored dingos, and armored forces of the Second U. S. Army Corps, in five Half-Tracks with 75-millimeter guns. . . . As Half-Tracks built by Autocar are helping to make history, so is their manufacture training the men and women of Autocar to make better Autocar *trucks* for the days to come. You will want those trucks. In the meantime, we urge you to keep your pledge to the Truck Conservation Corps.

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"For excellence of production" for the Army, the Navy, the Marine Corps, and the Air Forces.

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Telex, the specially prepared paint for resurfacing all types of telephone equipment, operating rooms, offices and buildings, announces appointment of the following companies as distributors for Telex Paints, Varnishes, Lacquers, and Enamels:

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Resurface equipment and buildings now with Telex Products. Government restrictions on the use of materials and equipment make regular resurfacing a "must" as a means of prolonging the life of present equipment. Contact your jobber's salesman for detailed information about this *special* telephone exchange paint.

PERFECT PAINT SALES

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MARK TIME INDICATORS FOR "POLICING" RURAL LINES

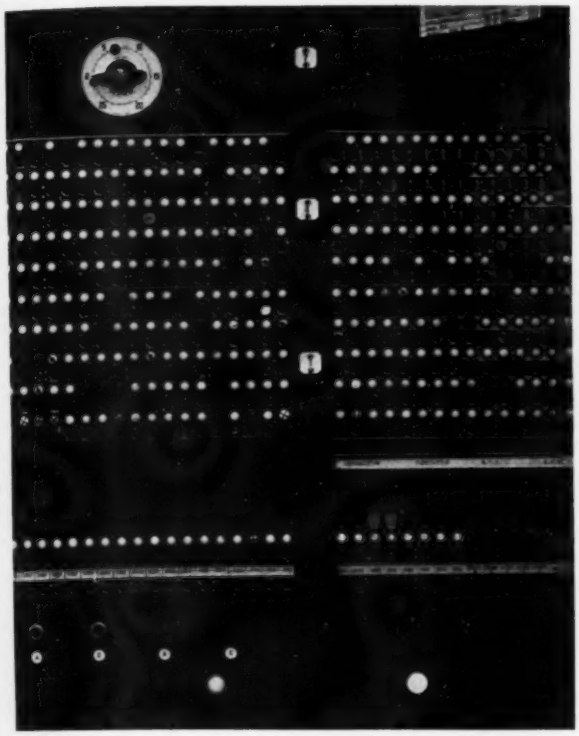

Fig. 1. Mark Timer installed on a vacant panel of switchboard. Note two pieces of tape on the 320 and 330 rural lines (lower right) which are to be "policed" for the day.

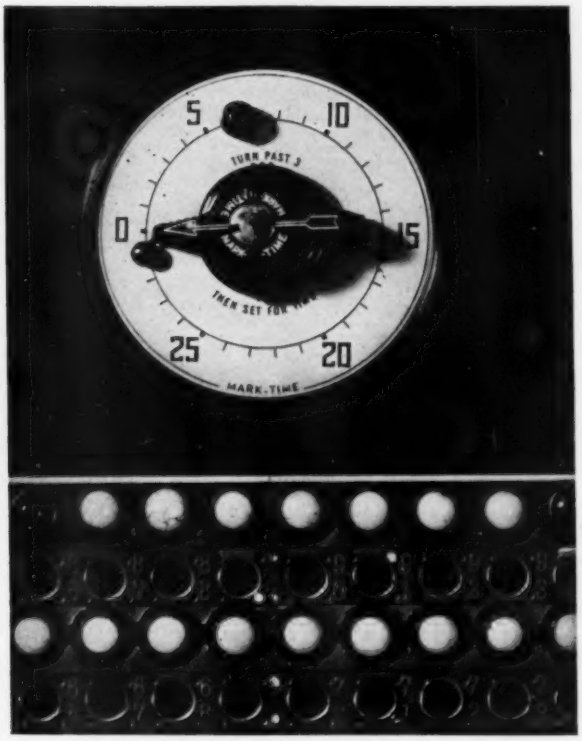

Fig. 2. Close-up view of the Mark Timer installation at Nappanee, Ind. The pin installed at the six-minute position on the dial is a 6-32 shoulder screw.

Several inquiries concerning the use of "Mark Time" elapsed time indicators for use in "policing" rural party lines as described on page 36 of the May 1 issue of TELEPHONY have induced LaMar Stoops, manager, Nappanee (Ind.) Telephone Co. to send in the accompanying illustrations showing an actual installation.

Fig. 1 shows the "Mark Timer" installed on a vacant panel of the switchboard. Note the two pieces of tape on the 320 and 330 rural lines (lower right) indicating the lines to be "policed" for the day. When tape is used it is suggested about one-eighth of an inch be turned under at the top edge, thereby giving a "handle" for easy removal. A little carbontetrachloride on a cloth easily removes any tape marks left.

Fig. 2 is a close-up of the installation. The pin installed at the six-minute position on the dial is a 6-32 shoulder screw. As a matter of caution, do not drill too deeply or the works of the timer may be damaged. The "Mark Time" units come mounted on a base which is easily removed. They may be purchased for about $3.25 and usually may be obtained at photo supply shops, or through doctor's supply catalogs in the X-ray accessory section.

New York Telephone Executive Dies

Walter Scott Bates, general commercial manager for the Long Island area of the New York Telephone Co., died July 11. His age was 46.

He was born in Philadelphia and educated at the United States Military Academy at West Point and at the University of Pennsylvania. He went into the telephone business in 1922 as a clerk with the Bell Telephone Co. of Pennsylvania and four years later was made commercial superintendent.

In 1926 Mr. Bates was sent to Madrid, Spain, as commercial director of the International Telephone & Telegraph Co. After a year he returned to the United States and was appointed engineer on customer relations activities with the New York office of the American Telephone & Telegraph Co.

Later that year he joined the New York Telephone Co. as general commercial supervisor of the Manhattan area. In 1939 he was made general commercial manager of Long Island.

Three years later, at the request of the United States government, Mr. Bates took an assignment with the division of supply of the War Production Board. He completed the task in six months and returned to the telephone company.

During the first World War he fought in Flanders with the North Umberland Fusilliers of the British Army and then joined the AEF, where he rose to the rank of major. He served in the Aisne-Marne, the Champaigne-Marne and the Meuse-Argone campaigns. Mr. Bates was wounded twice and received the Croix de Guerre, Purple Heart and Legion of Honor with two citations.

V V

Change at Kansas Exchange

H. A. WOOD has resigned as manager of the Lockwood, Mo. exchange of the Western Light & Telephone Co. and has moved to Shelbina, Mo. Mr. Wood has been replaced at Lockwood by ONAS WHITE, who has been manager of the company's exchange at Ash Grove, Kan.

(Concluded from page 18)

conversation. This is all the more reason to wonder why more of the larger companies have not adopted four-party selective ringing for exchange service.

* * *

The other day we heard a certain individual complaining of the hardships of war. It seemed he ordered some shovels with 60-inch handles, but was forced to accept them equipped with 54-inch blades. The fellow is no doubt saying that Sherman was right.

* * *

An interesting news letter from W. Chetham-Strode to a New York executive on the telephone and telegraph industry of Britain during the war is published on page 9. The following is quoted from this letter to indicate the numerous communication difficulties being experienced in England:

"There is hardly a main road in the country without at least one cable somewhere beneath its surface. Frequently, where cables converge towards the exchanges, there may be as many as 100 buried below one thoroughfare. In the towns these often run alongside gas, water, electricity, sewer and other services—services which do not mix well when all are smashed by high explosives, and, on many occasions, they have been smashed and mixed together."

* * *

We continue to hear of men in the field experiencing difficulties in using solder having a low tin content. This difficulty, so we understand, is encountered both on cable splicing and the soldering of wiring connections on equipment. If anyone has learned any kinks as to how such difficulties may be avoided, please let us have the facts so that we may pass them along for the good of the industry.

V V

Railway Express Employes Given Hints On Using Telephone

A recent issue of *Serving*, the monthly bulletin issued by the public relations department of the Railway Express Agency, and sent in to TELEPHONY by J. R. Carter of the Home Telephone Co., Perry, Mo., presents the following advice in wartime usage of the telephone, which although directed specifically to Railway Express employes, are suitable for all telephone users:

Lines of communication must be kept open! Right now in every battle area throughout the world this thought governs each military leader, whether he is engaged in a great offensive or is on the dogged defensive. So it has been since the beginning of recorded history.

(Courtesy WISCONSIN TELEPHONE NEWS)

Telephone poles, rigged up by her crew into a makeshift rudder, steered this crippled seaplane tender across the Pacific Ocean and into Pearl Harbor after a Jap bomber scored a hit off Guadalcanal. The ship is the "McFarland," a converted 1200-ton destroyer, and the above photograph shows her damaged stern and the jury rudder.

—A runner from Marathon to Athens in 490 B.C. brought news of a great victory over the Persians.

—Paul Revere, on his midnight ride, kept open communications that led to our war for freedom.

—Andrew Jackson won a great battle at New Orleans while slow communications held up word that peace had already been declared.

These were the lines of communication yesterday! Lines of communication must be kept open — and modern science has contributed marvels to this end. Telegraph — telephone — radio — even the "walkie-talkie"—each handling communications in the merest fraction of time and with a minimum of effort.

Their importance to our victory on the battlefront, their contribution to our battle of production on the homefront, cannot be overestimated.

And of all these—the commonplace telephone to us is the most important.

A war contract has been let to a manufacturer 2,000 miles away. Important changes develop at the last minute. A long distance telephone call —expert talking with expert—an interdepartment call and major changes are under way almost in a matter of minutes. The order is completed and ready to ship. Special handling must be arranged.

A telephone call to Railway Express, thence calls to operating supervisors, and in a matter of minutes the shipment is ready for pick-up and special handling.

Railway expressmen cannot be too careful in maintaining this important line of communication on the home front. They can help in numerous small but important ways:

(1) The telephone should be answered promptly. This saves time and shows efficiency.

(2) When answering, operator should say "Railway Express." When call is switched to a department, the person answering should identify the department, then give his own name.

(3) Don't transfer a call to some one else if you can take care of it. Make a memorandum — obtain the information—then call back to inquirer.

(4) Line up definite responsibility in the office for answering the telephone. Ever notice several in the office . . . each waiting for the other to answer the telephone?

(5) Accurately receive information over the telephone, then record it correctly.

(6) A loud conversation with others in the office while the line is still open may be neither educational nor amusing to the one on the other end.

(7) Don't keep customers waiting while you try to locate something. They might want to look for something of their own. Call them back.

(8) Be courteous over the telephone at all times. *You* are *Railway Express* on *your* end of the line.

Let us handle our lines of communication on the homefront with the same promptness, accuracy and efficiency we would handle a message on the battlefront. Both are essential to victory.

V V

N. Y. Train Calls Up

The train information telephone bureau of Grand Central Terminal, New York City, handled 2,819,019 telephone calls during 1942, an increase of 25 per cent over 1941.

A Telephone Woman Finds a Way

There seems to be no limit to the versatility of telephone employes, as proved at Granada, Minn., recently when high winds and a heavy rainstorm tangled the telephone lines of the Granada Telephone Co., of which Mrs. F. D. Grout is secretary and manager. Several lines were mixed up in a tree top in the flooded creek area near one subscriber.

Mrs. Grout recalled that her late husband had sometimes used a throw-line with a weight on the end to catch elusive telephone wires and pull them free from entanglement. So Mrs. Grout and her helper, Elwin Simmons, obtained a clothesline, fastened a weight on one end and tied the other end of the line securely. After several casts, the helper succeeded in catching the wire and pulled it free.

Mrs. Grout's nephew, who used to help her with the telephone work, has gone to war and her daughter now lives in California, but she and Mr. Simmons are continuing to furnish service to their community in spite of difficulties.

V V

Two Telephone Women Install Telephone in Lineman's Absence

Recently when the trouble-shooter for the Central Kansas Telephone Co. could not get to Mound Valley, Kan., because of high flood waters, Mr. and Mrs. Carrier who live north of town ordered a telephone installed. Ruth Jackson, manager of the company at Mound Valley, and Fern Baker, operator, went into a huddle. What to do, what to do?

These two efficient women employes came out of the huddle, and, spurred by determination and a will-to-serve, went to the Carrier home where they personally installed the telephone. And it worked!

"A later inspection showed they did a good job and no changes were necessary," states V. E. Code of the Central Kansas company in Topeka.

V V

Mark Caster of Lincoln, Neb., Goes with WPB

Mark T. Caster has resigned as head of the Nebraska war salvage campaign and gone to Washington to serve with the communications equipment division of the War Production Board.

Mr. Caster was for years general plant superintendent of the Lincoln (Neb.) Telephone & Telegraph Co., but has been on the retired list for several years.

Aid in today's emergencies

KLEIN'S

Communication lines are jammed with vital messages —power lines are carrying greater loads than ever before. To keep lines working in the face of today's emergencies is the job that Public Utilities are ably performing.

The ability of Klein quality equipment to meet the demands of this unusual service is proving the foresight of those men who demanded the best when purchasing pliers and climbers, safety straps and belts, grips and wrenches.

Of necessity, Klein production today is largely devoted to supplying the needs of the Army and Navy. It is important therefore that every piece of equipment in civilian use be properly cared for to assure it's delivering the long life which is inherent in any product carrying the name KLEIN.

To aid in making tools last longer, give better service, Klein has prepared a booklet, "Long Life to Tools," a copy of which will be mailed to anyone interested.

This book on the care and safe use of tools will be sent without charge on request.

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In the Nation's Capital

(Concluded from page 17)

tains another significant restriction on organized labor which has nothing to do with strikes. That is the prohibition against political contributions by labor unions. President Roosevelt criticized this in his veto message, as well he might, in view of past benefits received by his own political campaigns from labor union sources.

But if it is fair for the Public Utility Holding Company Act, for example, to make it a criminal offense for public utilities under that law to make donations to political campaigns or candidates, why is it unfair to impose a similar restriction on labor unions? Workers can still contribute as individuals. The law simply stops certain labor leaders from using union funds (contributed by individual workers) for such purposes.

The result of this clause may be to curtail the effectiveness of certain labor union lobbyists who even now are threatening to "purge" every Senator and member of Congress who voted to override the President's veto of this legislation. If these Congressmen are defeated (and this writer believes that the threatened "purge" will be no more effective than the New Deal senatorial "purge" of '38) at least they will not be defeated by means of union labor funds donated in the aggregate.

Indeed, Congress is quite likely to consider a bill introduced by Senator Hatch, Democrat of New Mexico, to extend this restriction on political contributions to cover all employer associations or non-profit organizations and make the prohibition on labor union contributions become part of the Federal Corrupt Practices Act. After all, if it is wrong for labor unions to contribute to political activities in time of war, it is just as wrong in time of peace.

* * *

Turning now to the political aspect, it seems, in retrospect, that the struggle over the War Labor Disputes Act between the President and Congress was chiefly political. Not a single reputable Washington observer has yet ventured the comment that the President's veto was free from political considerations. On the contrary, the belief that it was not free is generally accepted in the nation's capital.

And it seemed pretty good politics at the time of the President's veto. But the speed with which Congress overrode the President's veto turned what *seemed* like good politics into pretty poor politics. The effect of the overwhelming sentiment of Congress has been to put the President in a position of political isolation along with labor lobbyists.

For a number of years the latter, with the help of the administration, had been able to stave off legislation affecting their right to strike. They have done this with a non-strike pledge which became rather untenable during the coal strike. So far only the A.F.L. and the C.I.O., plus left-wing elements in the American Labor Party and the Communists, can be counted among the opposition to the bill as integral groups. There may have been other opposition but it was not open, and certainly it was not strong enough to stem the rising tide of Congressional anger over labor union abuses.

The situation was only aggravated by the President's belated proposal to draft men up to 65 years old so that strikers might be put into uniform. First of all, such a proposal had already been made last March in a bill introduced by Senator Byrd of Virginia. At that time Mr. Roosevelt and the labor lobbyists stoutly opposed such legislation. Indeed, high administration officials went to Congress and blasted the bill. Then, after Congress had passed a much milder measure, the President reversed his own position and favored a course which only Senator Byrd had openly advocated.

The cynical view is that President Roosevelt knew very well there was not the slightest chance of a bill to put strikers in uniform passing Congress. There are even those who say the White House threw in that suggestion about putting strikers in the Army solely to support the veto of the Smith-Connally bill.

In any event, admitting that the War Labor Disputes Act is not perfect legislation, its defects can be cured by amendment. The important thing, at this time, is to show the nation that Congress is not entirely helpless to discipline labor unions when they seem in need of a little discipline, to say the least.

* * *

It has only lately become generally known that the National War Labor Board has instructed regional boards to require all public utilities to state whether they are seeking to increase their rates or charges if wage and salary increases are ordered or approved. In action taken on May 30, but only recently publicized, the NWLB stated:

"If the answer is yes, the wage or salary increase may not become finally effective until it is approved by the Director of Economic Stabilization or until the Regional Board is informed by the Office of Price Administration that such approval is not required since the wage or salary increase can be absorbed."

Cases involving common carriers and other public utilities should be treated exactly as all other cases, the board said. The Director of Economic Stabilization recently ruled that wage or salary increases which might affect rates or charges are subject to Executive Order 9250, the NWLB added.

The Director of Economic Stabilization's ruling came after a question had been raised as to whether such increases approved or ordered by the board were subject to his approval.

V V

Best Story of the Week — What's Yours?

K. L. Schroeder, general superintendent of the Ohio Community Telephone Co., Cadiz, Ohio, tells of one of the newer operators who had just started to work the toll position and was not entirely accustomed to using standard abbreviations. She was on duty at the time a local doctor placed a long distance call to another doctor in Wheeling, W. Va. After reaching the Wheeling exchange she encountered a busy line and reported to the Cadiz doctor that she was sorry but the number he was trying to get was DA.

The doctor was also sorry to hear this, he told her, because if DA had the same meaning in her lingo as it did in medical terms, it meant "Dead on arrival!"

P.S. In traffic terms DA means "Don't answer" whereas the operator meant to convey "the line is busy" or (BY).

Notes to Navy March Taken by Telephone

From Corpus Christi, Tex., comes the story about Secretary Knox and Adm. A. E. Montgomery going to inspect the Ward Island naval air technical training center but the musicians didn't have "The Admiral's March."

A horn-blower scurried to the telephone and took the march, note by note, from a bandman at the nearby naval center. A boatswain's whistle piped it back as a check.

When the dignitaries arrived, the band was ready.

Signal Corps Announces Administrative Changes

Changes in the administrative structure of the Signal Corps, Army Service Forces, designed to provide for greater flexibility in the organization's job of developing, procuring, maintaining and distributing signal equipment for the Army, were announced July 10 by the War Department.

Three new services are created under the new set-up—the Engineering and Technical Service, Procurement and Distribution Service, and the Personnel and Training Service. All of these services were created to effect a grouping of like functions under centralized control.

In addition, the Army Pictorial Service, formerly under headquarters, Army Service Forces, has been returned to the jurisdiction of the Chief Signal Officer. Changes have been effected in the organization of the old Signal Operating Service, and its designation has been changed to Army Communications Service.

Under the new organization, the Signal Corps is composed of five operating services. Formerly there were two —the Signal Supply Service and the Signal Operating Service. The Signal Supply Service's functions have been taken over by the newly-created Engineering and Technical Service and the Procurement and Distribution Service.

The Chief Signal Officer is Maj. Gen. Harry C. Ingles, who recently succeeded Maj. Gen. Dawson Olmstead (TELEPHONY, July 17, p. 17). Maj Gen. James A. Code, Jr., remains as Assistant Chief Signal Officer.

The chiefs of the new services are:

Engineering and Technical Service—Maj. Gen. Roger B. Colton, former chief of the Signal Supply Service.

Procurement and Distribution Service—Maj. Gen. William Henry Harrison, former director of Procurement, Army Service Forces, and former chief of the Army Pictorial Service.

Personnel and Training Service — Brig. Gen. J. V. Matejka, former Chief Signal Officer of the North African Theater of Operations.

Army Communications Services — Brig. Gen. F. E. Stoner, former chief of the Signal Operating Service.

Army Pictorial Service—Col. Kirk B. Lawton, former deputy chief of the Army Pictorial Service.

In the new Procurement and Distribution Service, there are two divisions —the Procurement Division, headed by Col. E. V. Eldor, and the Distribution Division, headed by Col. George I. Back.

The newly-created Personnel and Training Service will be in direct con-

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This typical American expression of finality describes exactly how telephone men feel when they string Amertel wire. They know that sound engineering and lasting construction calls for the very qualities offered by Amertel wire or Amerstrand steel strand.

This is true regardless of weather and local conditions for there's an Amertel wire for the longest span or the shortest span . . . for the heavy loading zone and the light loading zone.

And, right now this extra strength and quality that's in every inch of every type of Amertel is more important than ever. It helps do away with repairs, replacements and service calls. Because it does it helps save steel, machinery, manpower and rubber.

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trol of all personnel of the Signal Corps, both military and civilian, in accordance with the Army Service Forces' policy of putting all personnel under one head. Formerly, civilian personnel of the Signal Corps was under the executive officer of the Office of the Chief Signal Officer. Military personnel was under the signal troops division of the Signal Operating Service.

Other Signal Corps assignments, all of which are the same as under the old organization, are:

Executive Officer, Col. William D. Hamlin.

Office of Planning, Col. F. H. Lanahan, Jr.

Fiscal Division, Col. J. T. Watson, Jr.

Legal Division, Col. C. E. Snow.

The *Control Division* now is under Lt. Col. Don L. Stevens.

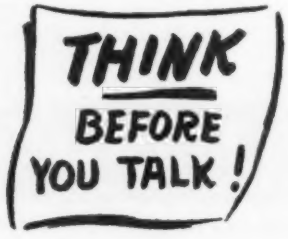
V V

Colonel Henry Returns from Military Mission

Col. Wm. C. Henry of the U. S. Army Signal Corps, formerly general manager of the Northern Ohio Telephone Co., Bellevue, recently returned to this country from a five-weeks' trip to North Africa on a secret mission for the Chief Signal Officer of the United States Army, in connection with future military moves in that theater of war. The trip was made by military airplane, going by way of Natal, Brazil, to Dakar, West Africa, and returning to the U. S. by way of England, Iceland, and Newfoundland.

Colonel Henry spent approximately two weeks in Algiers, and his duties took him east to Tunis and Bizerte through the center of the recent battle areas. The trip from Prestwick, Scotland, to New York City was made in less than 24 hours, despite a five-hour stop in Newfoundland for minor engine repairs.

Since entering the service as liaison officer for the United States Independent Telephone Association in the office of the Chief Signal Officer, Colonel Henry's duties have taken him into all nine army service commands in the continental United States, the tenth service command in Canada and in American, African and Asiatic theaters of war.



SUBSCRIBERS TOLD THEIR TELEPHONES MAY BE DRAFTED

WARNING subscribers that their telephones may be drafted, the Ohio Bell Telephone Co. recently mailed out a small folder (3¼ ins. x 6 ins.) explaining the government's wartime curtailment of telephone service. The attractive front cover of the folder is reproduced on the right, while the message printed inside the folder, carrying the title "A Further Mobilization of Telephone Service for the War Effort," is quoted as follows:

"A recent order of the War Production Board has placed all services installed or reconnected on or after April 15, 1943, in reserve for possible duty in the war effort. That means that should you have service reconnected, either because of moving to a new address or because of a temporary disconnection, it will be with the understanding that it may later be disconnected if needed for war purposes.

"In addition, the order says present subscribers as well as new ones may be asked to share their telephone line with other parties if this is necessary to provide more lines for essential war services.

"We hope and expect that you will not be affected but we want you to know what may be necessary. We know you are as anxious as we are to co-

operate fully in giving the war effort first call for telephone service it requires."

BOOK REVIEW

ELECTROMAGNETIC WAVES, by S. A. Schelkunoff, member of the technical staff, Bell Telephone Laboratories, Inc.; 515 pages, price $7.50. Publisher, D. Van Nostrand Co. Copies may be ordered through Telephony Publishing Corp., 608 So. Dearborn Street, Chicago, Ill. (Zone 5).

This highly technical book is intended as a textbook and for reference. In it a practicing engineer will find basic theoretical information on radiation, wave propagation, wave guides and resonators. Those engaged in theoretical research will find a stock of equations which may serve as a starting point for further investigation.

Chapters 1 and 3 deal briefly with vector analysis and special functions, such as Bessel functions and Legendre functions and are intended for ready reference. Chapter 2 deals with applications of complex variables to the theory of oscillations and waves and Chapter 4 reviews the fundamental conceptions and equations. The elements of circuit theory are presented in Chapter 5. Chapter 6 is concerned with some general aspects of waves in free space, on wires and in wave guides. The last few sections of the book cover electrostatics and magnetostatics to the extent needed in wave theory. Chapter 9 deals with radiation from known current distributions and to the directive properties of antennas, antenna arrays and electric horns. Chapter 12 deals with certain impedance discontinuities in wave guides.

While this book is highly technical, it is believed that it will serve a most useful purpose for telephone engineers who may be called upon to design coaxial cable systems.

V V

Father Builds Morale

Family ties are so close in the George Wilson household of Akron, Ohio, that when the three sons, Harry, Ed and Robert, left for the armed services, they were deeply afflicted with homesickness. Their father urged the boys to call home, charges reversed, whenever they felt like it. As a result, the telephone bill in the Wilson home has run between $30 and $45 monthly.

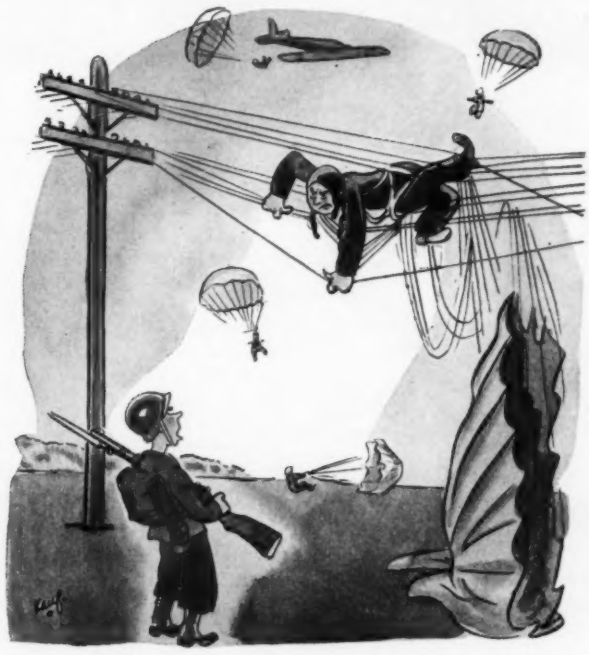
Marketing Chart of U. S. Lists Residence Telephones

A 1943 edition of "A Basic Marketing Chart of the United States," published by the Research Co. of America, New York City, includes a column of figures on residence telephones in the country by states and geographical divisions, as of January 1, 1943, presenting them in thousands.

Another column shows the percentage of total telephones each state and division has in comparison with the total telephones in the United States.

Figures in each of these columns follow:

State and Geographic Division	*Number in Thousands*	*Percentage U. S.*
Maine	108.7	0.7
New Hampshire	72.5	0.4
Vermont	47.5	0.2
Massachusetts	697.2	4.2
Rhode Island	97.8	0.6
Connecticut	320.7	2.0
NEW ENGLAND DIVISION	1,344.4	8.1
New York	1,762.3	10.7
New Jersey	582.1	3.5
Pennsylvania	1,249.2	7.5
MIDDLE ATLANTIC DIVISION	3,593.6	21.7
Ohio	1,128.9	6.8
Indiana	504.9	3.1
Illinois	1,360.5	8.2
Michigan	823.3	5.0
Wisconsin	449.6	2.7
EAST NORTH CENTRAL DIVISION	4,267.2	25.8
Minnesota	452.2	2.8
Iowa	461.5	2.8
Missouri	525.4	3.2
North Dakota	52.6	0.3
South Dakota	70.0	0.4
Nebraska	192.6	1.2
Kansas	294.6	1.7
WEST NORTH CENTRAL DIVISION	2,048.9	12.4
Delaware	40.6	0.2
Maryland	254.1	1.5
District of Columbia	175.3	1.1
Virginia	252.3	1.5
West Virginia	138.3	0.8
North Carolina	166.8	1.0
South Carolina	68.8	0.4
Georgia	186.5	1.2
Florida	146.5	0.9
SOUTH ATLANTIC DIVISION	1,429.2	8.6
Kentucky	191.9	1.2
Tennessee	232.5	1.4
Alabama	124.0	0.7
Mississippi	63.9	0.4
EAST SOUTH CENTRAL DIVISION	612.3	3.7
Arkansas	76.5	0.5
Louisiana	164.4	1.0
Oklahoma	212.6	1.3
Texas	583.7	3.5
WEST SOUTH CENTRAL DIVISION	1,037.2	6.3
Montana	52.3	0.3
Idaho	51.0	0.3
Wyoming	26.1	0.2
Colorado	161.7	1.0
New Mexico	25.0	0.2
Arizona	40.4	0.2
Utah	67.4	0.4
Nevada	13.9	0.1
MOUNTAIN DIVISION	437.8	2.7
Washington	290.3	1.8
Oregon	151.8	0.9
California	1,349.7	8.2
PACIFIC DIVISION	1,791.8	10.9
UNITED STATES	16,562.4	100.0



"THE UMPIRE SAYS YOU'VE BEEN TAKEN PRISONER AND CAN'T POSSIBLY BE INTERRUPTING ANY COMMUNICATIONS."

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THE FAST, EASY WAY OF MAKING TAP-OFF CONNECTIONS

● Here's a new Nicopress Sleeve that materially increases efficiency in making tap-off connections.

Nico-Taps meet every requirement for this type of work. Completed connections are strong, tight and efficient. And besides, Nico-Taps are real time savers. They are split, thus eliminating all need of cutting the line wire to make the connection. All you do is slip the sleeve over the wire and compress with your Nicopress Tool.

Nico-Taps are now available in three sizes; one for tap-offs from 17 or 18 B&S to 17 or 18 B&S (Stock No. T2-045B), one from 12 B.W.G. to 12 B.W.G. (Stock No. T2-109D), and one, a reducing sleeve, from 12 B.W.G. to 17 or 18 B&S (Stock No. T2-109x045D).

BUCKEYE
TELEPHONE & SUPPLY CO.
COLUMBUS, OHIO

England's Communications

(Continued from page 15)

on the canal. A special call took 15 minutes to mature owing to dislocation of the telephone services, but the important message was safely passed and the reply obtained with the guns in action throughout.'

"At some of the quieter country exchanges the work is done during the night by elderly caretakers. An exchange in a Yorkshire village is looked after by a 74-year old man and his wife. During one raid thousands of incendiaries fell in the neighborhood, and hundreds of high explosives were dropped in a raid that lasted for nine hours. But this old couple sat at their switchboard on the top floor of that country exchange and handled a flood of fire, ambulance and rescue calls. When asked why they did not take cover they answered that it had not occurred to them.

"Just to sit there and carry on as though nothing were happening outside is not easy. The reactions of new operators during the first raid are always interesting. To one girl of 16 years of age who glanced around a little furtively when the bombs came down and the machine guns chattered, it was suggested that she might like to go to the basement for a while. But she replied, just as a bomb shook the building: 'Oh no. I must see it through.'

"Probably telephone operators in Canada and America are trained to use set phrases while handling calls at the switchboard the same as the British operators, but mistakes do creep in now and again. It happened once at Dover, the town nearest to France. Dover has to put up with shelling in addition to the raiding aircraft. During one attack a newly trained telephonist was dealing with a call from a kiosk. As the first three minutes expired, the telephonist with one eye on the red time lamp and one ear turned to the falling shells, broke into circuit to advise the called 'Your time is up, please.' However, outside events must have gained control of her subconscious mind for just then a large shell exploded and she said, 'Your number's up!' That gave the caller such a shock that it was a few seconds before he could regain enough control to ask for an extension of time.

"And so the story could continue. The human side facing up to keeping the communications going however heavy the raids. But let us give some details of the system responsible for administrating and operating the services.

"For administrative purposes the country is divided into nine regions, of which the one covering London and its immediate environs is known as the London telecommunications region.

"In this London region there are 247 telephone exchanges; 210 within a 12½ mile radius from the center. These exchanges serve some 500,000 subscribers and deal with 15,000,000 calls every week. There are approximately 5,400,000 miles of telephone wire running in cables beneath the London streets.

"The region is divided into eight telephone areas—the city area, center area, and six areas in the form of sectors round these two areas.

"Each area is under the control of a telephone manager, assisted by divisional chiefs such as the area engineer who provides new installations, maintains the efficient working of the system and is responsible for repairing air raid damage to telephone plant; and the traffic and sales manager who is concerned with the operation and development of the services, the control of the operating staff and the bringing into use of emergency measures for the disposal of vital telephone calls when normal routes are damaged during raids.

"The air raid repair work is carried out by the normal engineering repair staff, but in order to ensure full and rapid co-ordination of all parts of the organization, a central 'control' has been established in each area, staffed night and day.

"Overall co-ordination between the different areas is arranged by means of a regional control.

"At each of these controls there is a complete range of maps and records with full details of the telephone cable distribution system, so that when bomb damage is reported and exactly located the probable damage to specific telephone plant can be estimated, and re-routing of important and vital circuits can be arranged without delay.

"Electrical tests of a number of the wires in the neighborhood are then made from the appropriate telephone exchanges, and from the results it can be readily determined which of the cables passing near the 'incident' have suffered damage.

"Control knows from the records whether any of these lines are of vital importance and can arrange immediately for these to be re-routed over undamaged cables. This re-routing can usually be done inside the exchanges

and does not require work at the site of the damage.

"As soon as inspection is possible, survey officers are sent out from the area control to make an investigation and to report on the damage and the nature of the repairs which may be necessary.

"Based on this report the repair squads, tools and materials are assembled at the site, and the work of restoration proceeds as quickly as possible, in collaboration with other public utility services which are usually affected at the same point.

"Damage to telephone exchanges has ranged from broken windows to a complete knock-out. The latter, fortunately, has been a rare occurrence, and, owing to the exercise of foresight and engineering ingenuity, alternative provision has been rapidly made.

"The end is not yet, but the telephone and telegraph folk of Britain face the future with quiet confidence, and consider that they can keep communications going despite anything that the enemy may do."

V V

Fred Strasser Heads Pioneer Chapter in Nebraska

The late Louis C. Anderson, of Lincoln, Neb., president of the Frank H. Woods Chapter of the Independent Pioneer Telephone Association (TELEPHONY, July 17, p. 41), has been succeeded as head of the organization by Fred M. Strasser, supervisor of supplies at the Lincoln office.

M. M. Hale, commercial engineer, Lincoln, was named vice president to replace Claude Walker of Mead. O. L. Sturdevant, general plant department, was named treasurer to succeed J. H. Hartley, while Florence Johnston, Lincoln, remains as secretary. Vern Campbell of David City and Myrtle Hiner of Lincoln, were added to the executive committee.

V V

Personnel Changes Made By Puerto Rico Company

It is reported that a shift of top-flight personnel within the Puerto Rico Telephone Co. has taken place with the announcement that John E. Howell, general manager, is leaving for New York, and that J. A. Zerbe has been appointed vice-president in charge of operations and Jose D. Dominguez, general manager.

Mr. Zerbe announced that direct radio-telephone service with New York was inaugurated on July 7.

Mr. Howell states he is going to New York for a few months and afterwards to some foreign assignment not yet disclosed.

GRAY PAY STATIONS

Help Overcome Wartime Service Difficulties

Paystations solve many wartime problems of service. With them you can meet the telephone needs of large numbers of people, in spite of restrictions on individual telephone instruments.

New war plant areas have gas stations, drug stores, and restaurants where paystations can be installed. Army, navy and marine encampments need paystations.

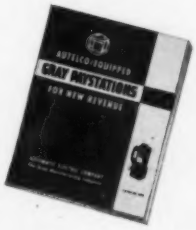
In all these places, Gray Paystations provide the means of serving more people with the least amount of equipment. Moreover, Gray Paystations are consistent revenue producers for telephone operating companies, and they'll produce in peacetime later as well as they produce in wartime now.

THE NEW TYPE 60 SERIES PAY STATIONS

Something new and better in paystations—the new Type 60 Autelco-Equipped Gray Paystations. That means they make use of such Automatic Electric improvements as the unique balanced anti-sidetone circuit and other features for better transmission, longer life, lower maintenance costs and more convenience.

Series 60 is available for automatic or manual exchanges; with handset or with conventional separate transmitter and receiver; and for post-pay or prepay operation.

Write for the complete new Automatic Electric catalog of Gray Paystations. It tells all about the new 60 Series and about all other Gray Paystations, too. It is a handy reference book which will help you select the paystations best suited to your particular needs. Ask for Catalog 4078.



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Don't Forget The Small Army Units

Small detachments often suffer keenly for want of adequate telephone service. Gray Telephone Pay Stations are the perfect solution. They can be quickly installed in sheds or make-shift shelters. Later, when the war need has been met, they can be put to work in congested sections of town.

Among others, Gray No. 34A9 Prepayment Type is ideal for this service. Local calls are handled automatically without the usual supervision. Special relay train at the central office controls collection or return of coins. Dual coin switch affords extreme protection against fraudulent use. Circuit is anti-sidetone and adapted for handset. Same station arranged for standard transmitter and receiver is coded No. 34A8.

AUTHORIZED AGENTS:
Automatic Electric Sales Corp.
Graybar Electric Company
Kellogg Switchboard & Supply Company
Leich Sales Corporation
The North Electric Mfg. Company
Stromberg-Carlson Company
Canadian Telephones & Supplies, Limited
Northern Electric Co., Limited

THE GRAY MFG. CO.
HARTFORD, CONN.

TEN LITTLE WORKERS
TEN LITTLE WORKERS, FEELING FIT AND FINE-
ONE SMOKED IN THE OIL HOUSE....
THEN THERE WERE NINE !!
NINE LITTLE WORKERS THOUGHT THEY'D BE LATE,
ONE CUT THRU THE R.R. YARDS....
THEN THERE WERE EIGHT!
EIGHT LITTLE WORKERS LOOKING UP TO HEAVEN
ONE FELL DOWN AN ELEVATOR SHAFT....
THEN THERE WERE SEVEN!
SEVEN LITTLE WORKERS PUTTING IN HARD LICKS
ONE MIXED BOOZE WITH GAS.....
THEN THERE WERE SIX!
SIX LITTLE WORKERS GLAD TO BE ALIVE,
ONE FORGOT HIS GOGGLES
THEN THERE WERE FIVE!
FIVE LITTLE WORKERS STANDING NEAR THE DOOR,
ONE THOUGHT A WIRE WAS "DEAD"....
THEN THERE WERE FOUR!
FOUR LITTLE WORKERS - ONE SCRATCHED HIS KNEE,
DIDN'T GO FOR FIRST AID.....
THEN THERE WERE THREE!
THREE LITTLE WORKERS - NOTHING MUCH TO DO,
ONE TRIED TO OIL A MOVING SHAFT.....
THEN THERE WERE TWO!
TWO LITTLE WORKERS TOOK STAIRWAYS ON THE RUN,
ONE MISSED HIS FOOTING....
THEN THERE WAS ONE!
ONE LITTLE WORKER - THOUGHT OF THE OTHER NINE-
BEGAN TO PRACTICE SAFETY—
NOW HE'S DOING FINE!

Telephone Luxury of Yesterday Is Now a Common Servant

A luxurious novelty of only 50 years ago was a telephone in a hotel guest's room. When a famous New York hotel, the Waldorf-Astoria celebrated its 50th birthday last spring, old-timers recalled that this was one of the first—and perhaps the first — of American hotels to have a telephone in each room. During the construction of the original Hotel Waldorf, the *Electrical World* reported:

"The new hotel, it is stated, is to be fitted with telephone communication between the office and every room. This is a system in use abroad, notably in the Adelphi, Liverpool. This feature in hotel service is an important one, especially in saving time. Instead of pushing the button and waiting for the bell boy, guests can communicate their order at once and have it filled in half the time."

The Waldorf-Astoria of today has 2,750 telephones.

V V

Telephone Gremlins Whisper In Subscribers' Ears

Gremlins, those strange little creatures who, flyers say, cause unexplained troubles in airplanes, are reported also to be telephone mischief-makers. In this work, observers declare, they cleverly avoid doing any damage themselves but provoke human beings to do it.

Here, for example, are a few things which telephone gremlins are said to whisper into some people's ears:

"Why waste your time looking up that number? Take a chance on it! If you get a wrong number, let the other fellow worry."

"Drat those telephone cords! Always getting twisted. Give them a yank or tie 'em in a knot—that'll help break the tiny wires inside."

"Talk as long as you can—it'll keep other people from calling, and maybe help tie up lines needed for important war calls."

"Now, bang your receiver down! It'll snap plenty in the other fellow's ear and jar the instrument too, but who cares?"

"Here's the place for your wet umbrella, right by the telephone. If the cords get wet and the 'phone won't work, it'll be fun to see a repairman looking for the trouble."

Operator Donned Hip Boots As Water Rose

During the floods last spring rising waters overflowed the banks of the Missouri River. The telephone operator on duty at the local exchange of the Mokane (Mo.) Telephone Co. donned hip boots and remained on the job, although there were 30 inches of water in her office as the river reached its highest stage on record.

Surpassing the 1903 and 1844 peaks, it went up 27 inches within 24 hours and continued to rise at a rate of an inch an hour to break all records.

V V

Two Property Transfers In Oklahoma

Recent changes of ownership among Oklahoma telephone exchanges include the following:

Sale by Mrs. James A. Schooler of the Bixby Telephone Co., at Bixby, Okla., to Dr. R. E. Daily. The Bixby exchange owns and operates about 250 stations. M. L. Anderson is the manager.

Purchase by W. C. Lovely from Fred Cartwright of the Oakwood Telephone Co. at Oakwood, Okla. The exchange is managed by the new owner and has 76 owned stations.

V V

Be Careful on Telephone, Air Cadets Warned

"Danger, enemies may be listening," is the warning printed on every telephone dial at the Cochran Army Air Field in Georgia. Lt. John Rosental, assistant public relations officer at the field, thought up the reminder to help telephone users remember that conversations often aid the enemy by disclosing information not intended for eavesdroppers.

V V

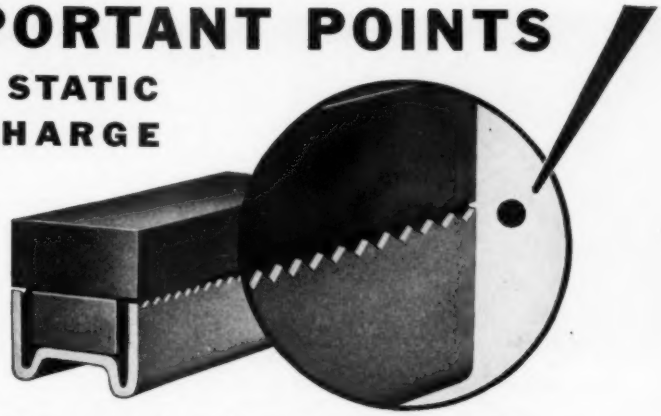
OBITUARY

JAMES D. BAKER, 60, for 14 years general manager of the Alberta Government Telephones at Edmonton, Alberta (Canada), died on July 10 after a brief illness. Mr. Baker was a well-known figure in the telephone business in Canada, a past president of the Telephone Association of Canada, past president of Alberta chapter of the Telephone Pioneers of America and an active worker in several engineering groups. He was a Rotarian and a member of the Masonic Order.

He is survived by his widow and one son, Lt. Frederick J. Baker, now on active service with the Royal Canadian Corps of Signals.

BUY WAR BONDS

IMPORTANT POINTS ...in STATIC DISCHARGE



These important points provide the essential difference between the Reliable P495 Self-cleaning Discharge Blocks and ordinary discharge blocks. These points give you the extreme sensitivity of carbon to carbon gaps and yet have none of the faults inherent in this or other types of blocks. The P495 Discharge Blocks are self-cleaning — eliminating dirty carbon trouble, reducing interruption of service and providing lower maintenance costs.

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Finest Quality

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SOUTHERN YELLOW PINE

Produced, Seasoned and Treated Under Careful Supervision of People That Have Pioneered in the Selection and Treatment of Forest Products.

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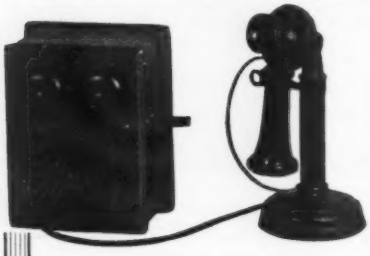
ALL the strength and durability inherent in steel are combined—with definite economies—in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

Ask the distributor of *Crapo* Galvanized Products near you or write direct for further information!

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA



Kellogg Desk Sets Now Available

A recent arrival of a good stock of Kellogg Desk Stands and other parts enables us to offer remanufactured Kellogg Desk Sets for immediate delivery. No increase in prices.

No. 103-3-bar, 1000 ohm...$12.60
No. 104-4-bar, 1600 ohm... 14.35
No. 105-5-bar, 1600 ohm... 14.85

Western Electric and Stromberg-Carlson sets also in limited quantities.

DEPEND ON SUTTLE

Chance Company Makes Changes in Sales Staff

William A. Moss, A. B. Chance Co. representative, who was recently transferred from Atlanta, Ga., to Kansas City, Mo., has completed his mission in the latter city and has been returned to Atlanta (TELEPHONY, June 12, p. 38).

E. G. RYMAN

E. G. Ryman, assistant sales manager for the Chance company, will continue the company's work in Kansas City as part of his new assignment to contact prime contractors and utility customers in Kansas City, St. Louis, Wichita, and Tulsa.

V V

Sound Systems Aid In Reducing Accidents

How the installation of sound equipment throughout war plants sharply reduces industrial accidents and also serves as a rapid means of communication was explained by A. R. Royle, sound division sales manager of the Stromberg-Carlson Co., to more than 250 safety engineers who attended the annual conference of the Wisconsin Council of Safety, held June 27 at the Hotel Schroeder, Milwaukee.

Highlighting the one-day convention, Mr. Royle illustrated his talk with demonstrations of the diversity of uses to which sound equipment is put in war manufacturing centers.

Pointing out that manufacturing problems have greatly increased due to increased speed of industrial production, Mr. Royle declared that the increasing employment of women and frequent black-out drills in plants, mainly along the Atlantic seaboard, have loomed as important factors in the efficient control of the mass movements of employes in emergencies.

"A plant sound system is the one sure means of rapid efficient communication. With it safety instructions can be given to prevent accidents. It can be used as a supplementary bulletin service, quoting and calling attention to the various instructions on bulletin boards. Direct instructions can be given during an emergency," Mr. Royle said.

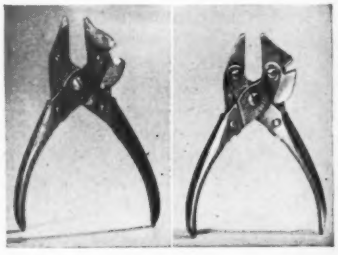
Besides being used for weather and traffic announcements, and other information vital to war workers, sound equipment, Mr. Royle asserted, is used for fire alarms, air raid alerts and all-clear signals.

As one of several examples to illustrate his statement, Mr. Royle cited a large eastern war plant, employing about 10,000 persons, which can completely black-out the factory in 20 seconds after an air raid alert signal, through the use of sound apparatus.

V V

Repair of Old Tool Conserves Materials

Among the tools received recently for repair by the Wm. Schollhorn Co., New Haven, Conn., was one which provided a striking illustration of the value of standardized parts. This quality is particularly desirable in the case of Bernard parallel action pliers and other small tools made by Schollhorn, because every part is replaceable, the company states.



The tool mentioned above was a pair of No. 102-4 in. Bernard parallel action pliers which had been purchased in 1919. As can be seen by the accompanying illustration, the cutting jaw and blade were badly nicked and an attempt had been made to grind new edges on them. Also one of the bolts was missing. A new jaw, cutter and bolt were inserted and the tool was reassembled and buffed. The repaired tool functioned efficiently. The jaws met accurately and the cutting jaws would cut a fine thread.

Today, when it is almost impossible to obtain new tools, it is most desirable to keep old ones in repair. The fact that parts for such tools as pliers are replaceable and that these tools can be repaired easily is an important aid in maintaining civilian economy.

Dos Palos (Calif.) Gets New Kellogg Switchboard

By the recent installation of a Kellogg Masterbuilt switchboard, the Dos Palos Telephone Co. of Dos Palos, Calif., effected an improvement in telephone service for the citizens of that community. An Army flying field in the vicinity of Dos Palos has resulted in a greatly increased traffic load. The new board is a 6-800 Masterbuilt with lines multipled on a three-panel basis, assuring susbcribers of prompt attention. Rural and toll lines are of the lamp signal ring-down type with audible busy test and the toll lines have busy indicating lamps.

Each position is equipped with 17 pairs of five-party individual ringing harmonic universal cord circuits, having double lamp supervision. The line cables are carried to the terminal room on an iron rack from whence they are connected to the relay bay and main distributing frame.

The Dos Palos Telephone Co. was organized in 1909. A single-position magneto switchboard adequately served the then small community. By 1915, the community had grown so that a large single-position Kellogg magneto board was purchased and shortly after was increased to two positions.

In 1930, the late S. D. Crowe, formerly of LaGrande, Ore., bought the capitol stock of the company. He improved the property by erecting the building which now houses the telephone exchange, and by rebuilding the outside plant which included installing cable and changing the system to two-wire metallic lines.

Officers of the company are Mary E. Crowe, president, and Richard D. Crowe, secretary and manager.

Taking advantage of picnic weather, approximately 350 men heartily enjoyed the annual picnic of the Strowger Automatic Club, employe organization of Automatic Electric Co. and its associated companies, which was held on Thursday, July 1. The above smiling group is typical of many scattered about the grounds—eating and drinking, playing games and running races. War saving stamps were awarded as prizes in the various events, and a further wartime touch was given by the absence of the many employes working on the night shift in the Automatic Electric plant. Left to right: J. BABKA, J. A. HAEFNER, R. B. HERRMANN, A. W. BLESSING, P. A. FOAGH, R. W. ENGSBERG, L. J. GADDIS, and H. M. BRUCKART.

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POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

C. M. Christiansen Co., Phelps, Wis.—Northern White Cedar Poles, plain or butt treated. Quotations on request.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

Pensacola Creosoting Company, Pensacola, Fla. — Creosoted Southern Pine Poles of Superior Long Leaf Quality.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

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Rates 10 cents per word payable in advance.
Minimum charge $2.00 for 20 words or less.

HELP WANTED

HELP WANTED: Experienced maintenance man for Magneto and C. B. State experience, references, age and salary expected. Exchanges located in Central Illinois. Write Moweaqua Home Telephone Co., Moweaqua, Ill.

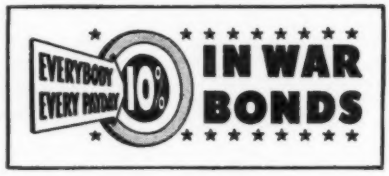
WANTED AT ONCE: Competent lineman and maintenance man by In dependent telephone company on Pacific Coast in state of Washington. Statement of availability and references required. Write Box 137, Forks, Washington.

WANTED: Wire Chief — Four exchanges, 3,200 stations — magneto and common battery. Must be able to furnish release or statement of availability. Write Box No. 9179, c/o TELEPHONY.

WANTED: Agent for magneto exchange 225 stations. Would consider man and wife—husband to be employed as trouble man or lineman. Write Box No. 9180, c/o TELEPHONY.

FOR SALE

FOR SALE TO SETTLE AN ESTATE: 150 Western Electric wall telephones, 1600 ohm-5-bar Stromberg-Carlson switchboard, 5000 glass insulators, 300 ten-pin crossarms. Write Mr. Smith Barnett, Winchester, Illinois.



WHITE TRUCKS — 2½ TON, Model 704. Completely rebuilt — nearly new rubber — new olive green paint job — divided shaft power winch and cable will accommodate gin poles up to 35 ft. high — stiff legs — ladder racks — pike pole holders — retractable roof — 10 locking tool compartments — trailer tow hook and many other telephone accessories. Write Geo. Thomas, 4921 S. Racine Ave., Chicago—Phone BOUlevard 6700.

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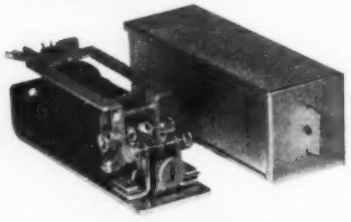

NO. 206 TYPE

IN STOCK

206-AA 206-AR
206-BG 206-BN
186-A

NO. 186 TYPE PRICES ON REQUEST

BUCKEYE
TELEPHONE & SUPPLY CO.
COLUMBUS, OHIO

Suttle Equipment Celebrates 33 Years of Operation

Celebrating the passing of a third of a century of continuous operation, the Suttle Equipment Co., in Lawrenceville, Ill., was recently honored by fellow merchants in a double-page spread of advertisements in the Lawrenceville newspapers, paying tribute to the accomplishments of the company since its organization in 1910. The paper also included items pertaining to wartime operations and personnel activities of the company.

Heading the Suttle company staff is Bert D. Quackenbush, vice-president and general manager. Others of the executive staff are:

William C. Strehl, sales manager; Carl H. Price, production superintendent; Maurice M. Shaw, printing department manager; Cleo J. Ray, chief shipping clerk; W. I. Vangilder, credit manager and purchasing agent; Russel C. Land, assistant production superintendent; A. Roy Paschal, foreman and T. Earl Cary, foreman.

V V

Southern Bell Women Workers Help Red Cross

Women employes of the Jacksonville, Fla., exchange of the Southern Bell Telephone & Telegraph Co. are making surgical dressings in a workroom of the company during their lunch hour.

An accredited Red Cross supervisor is in charge of the work room which is opened at noon each Monday, Tuesday and Thursday. The women telephone employes make the dressings on their own time and are doing a splendid job, it is reported.

Reconstructed Equipment

North Line and Cut-off relays for all relay boards, per pair @	$ 3.00
Kellogg or Dean 100 ohm drop coils @	.35
Western Elec. No. 46 C. B. Ind. Coils (Limited supply only) @	.50
Ericsson Watch Case Receivers less cord and band @	.70
Kellogg No. 729 C. B. Oak wood hotel sets with Straight line ringer or 16-33-50 or 66 Cycle Harmonic @	6.75
H. C. Motor Gen. Ringing Machine. Motor Shunt wound 220 Volts D.C. Type H.D. Gen. Type M.S.W. 80 Volts 20 Cycle @	50.00
Kellogg No. 115 Desk Type Grabaphones with 3 Cond. Cord @	5.00
Stromberg No. 9 Talk Through Repeating Coils @	1.10
Stromberg Carlson No. 69A Protectors with Fuses and Carbons 20 lines per strip @	3.00
Used Kellogg No. 42 Swbd. Plugs Practically New @	.40
Western Elec. No. 1078 Type Fuse Rack 40-50 and 60 Lines, sizes complete with fuses @	8.00
Western Elec. No. 1269 Arresters with heat coils and carbons 40 lines per bank @	20.00

REBUILT ELECTRIC EQUIPMENT CO.
1704 WEST 21st PLACE
CHICAGO

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ONLY ONE CONTACT!

- Reliable ringing service is essential in providing satisfactory telephone service.
- Use TELERING and provide the MOST reliable service at the LEAST cost.

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Positively No Radio Interference

- Directly converts Commercial Alternating Current to Telephone Ringing Current.
- You can always depend upon our full co-operation and prompt service.

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The United States of America
NORTH
"ALL-RELAY"